

Appendix A

Plan Sheets and Typical Cross-Section Drawing of Project Components

A.1 INTRODUCTION

This Appendix presents typical cross-section drawings of the line of protection (LOP). Figures presented in the Appendix include:

- Cover sheet with an index to drawings;
- Site aerials;
- Sheet key plan (overall cross-section of the LOP);
- Detailed drawings of LOP sections (broken down into 11 sections);
- LOP profile drawings;
- Levee, floodwall, and buried seawall drawings;
- Cross-sections of LOP vehicle and pedestrian access; and
- Miller Field Sub-alternatives.

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FILE: 698705G-001.dgn

6/2/2016

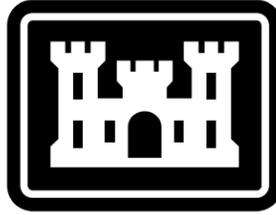
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VICINITY MAP
NTS



COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND

PHASE 1 FORT WADSWORTH TO OAKWOOD BEACH



LOCATION PLAN
NTS

INDEX TO DRAWINGS

SHT NO.	SHEET TITLE
G-001	COVER SHEET
G-101	OVERALL SITE AERIAL (1 OF 3)
G-102	OVERALL SITE AERIAL (2 OF 3)
G-103	OVERALL SITE AERIAL (3 OF 3)
G-104	SHEET KEY PLAN
C-100	SITE PLAN (1 OF 11)
C-101	SITE PLAN (2 OF 11)
C-102	SITE PLAN (3 OF 11)
C-103	SITE PLAN (4 OF 11)
C-104	SITE PLAN (5 OF 11)
C-105	SITE PLAN (6 OF 11)
C-106	SITE PLAN (7 OF 11)
C-107	SITE PLAN (8 OF 11)
C-108	SITE PLAN (9 OF 11)
C-109	SITE PLAN (10 OF 11)
C-110	SITE PLAN (11 OF 11)
C-301	SITE PROFILE (1 OF 6)
C-302	SITE PROFILE (2 OF 6)
C-303	SITE PROFILE (3 OF 6)
C-304	SITE PROFILE (4 OF 6)
C-305	SITE PROFILE (5 OF 6)
C-306	SITE PROFILE (6 OF 6)
C-501	TYPICAL SECTIONS REACH A-1
C-502	TYPICAL SECTIONS REACH A-2
C-503	TYPICAL SECTIONS REACH A-3
C-504	TYPICAL SECTIONS REACH A-4
C-505	TYPICAL SECTIONS REACH A-4 AT FORT WADSWORTH (1 OF 2)
C-506	TYPICAL SECTIONS REACH A-4 AT FORT WADSWORTH (2 OF 2)
C-507	TYPICAL SECTION BOARDWALK AND ROADWAY
C-508	TYPICAL SECTION BOARDWALK ACCESS
C-509	TYPICAL SECTION PEDESTRIAN ACCESS STAIRS
C-510	TYPICAL MVA AND DTP RAMP DETAIL
C-512	TYPICAL DRAINAGE CONTROL STRUCTURE
C-513	TIDE GATE STRUCTURE DETAILS
C-514	CONCRETE HEADWALL DETAILS
C-515	CLOSURE STRUCTURE PLAN AND ELEVATION
C-516	CLOSURE STRUCTURE DETAILS

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NO.	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/21/2016	MAP
1	REVISIONS FOR OUR COMMENTS	1/9/2015	MAP
			MARK

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS	DATE: 2/16/2011	SUBMITTED BY: MARK PIRELLO	DATE: 6/2/2016
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U.S. ARMY CORPS OF ENGINEERS NEW YORK ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil	MOFFATT & NICHOL 529 5th Avenue, 14th Floor New York, New York 10017 212-768-7454	PILOT DATE: 6/2/2016	PILOT SCALE: 1:2

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

COVER SHEET

SHEET
IDENTIFICATION
G-001
SHEET X OF Y

PATH: Q:\TA\6987-05\cadd\Active_Preliminary\

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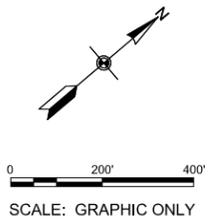
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MATCH LINE - SEE SHEET G-102

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1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP
			APPR.

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS NEW YORK	ISSUED BY: DMM	DATE: 06/01/16	SOLICITATION NO.:
FORN BY: DMM	MAP	CONTRACT NO.:	
SUBMITTED BY: MARK PIRELLO	FILE NUMBER:	FILE NAME:	
MOFFATT & NICHOL 529 9th Avenue, 14th Floor New York, New York 10017 212-768-7454	ANSI D 698705G-101.dgn	FILE NAME: 698705G-101.dgn	FILE NUMBER: XXXX

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

OVERALL SITE AERIAL (1 OF 3)

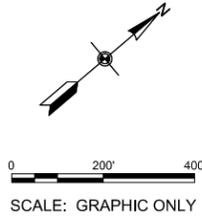
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G-101
SHEET OF



MATCH LINE - SEE SHEET G-101

MATCH LINE - SEE SHEET G-103

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COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

MARK	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP

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PROJECT: DORP0311	SUBMITTED BY: MARK PRELLO	CONTRACT NO.:	FILE NUMBER:

OVERALL SITE AERIAL (2 OF 3)

SHEET IDENTIFICATION
G-102
SHEET OF

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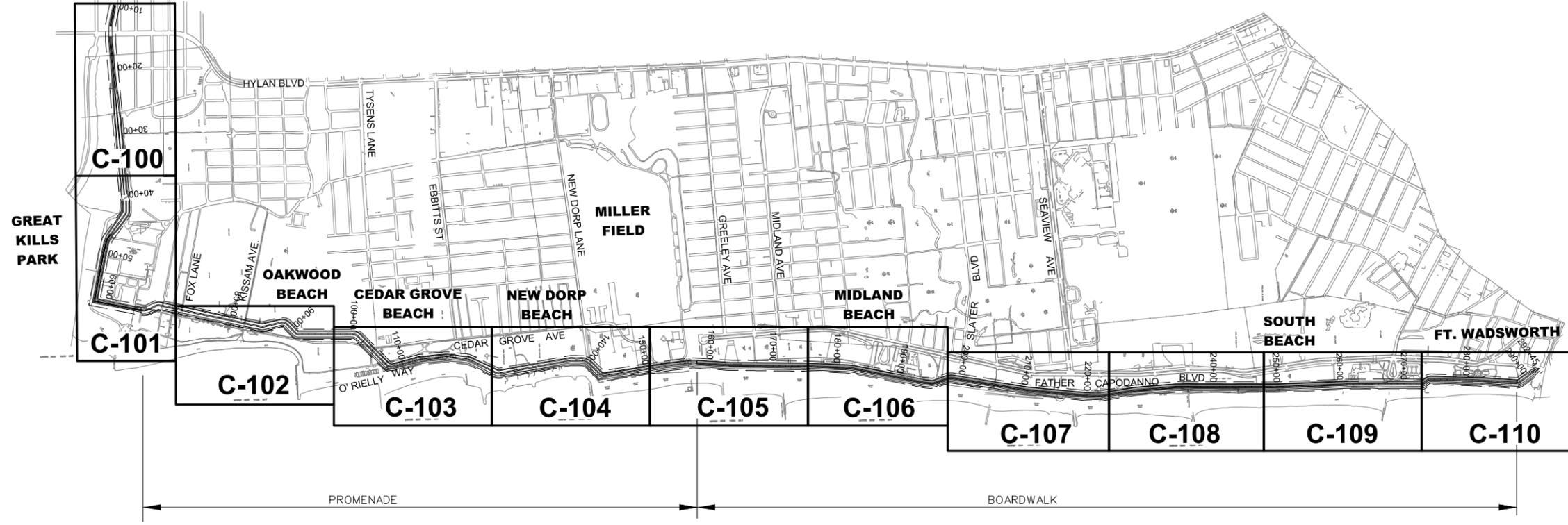
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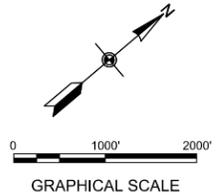
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MARK	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP

DESIGNED BY:	DATE:
DRAWN BY:	6/2/2016
CHECKED BY:	
MAP	
CONTRACT NO.:	
FILE NUMBER:	
PROJECT NO.:	
DATE:	
6/2/2016	
FILE NAME:	
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COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SHEET KEY PLAN

SHEET IDENTIFICATION
G-104
SHEET X OF Y

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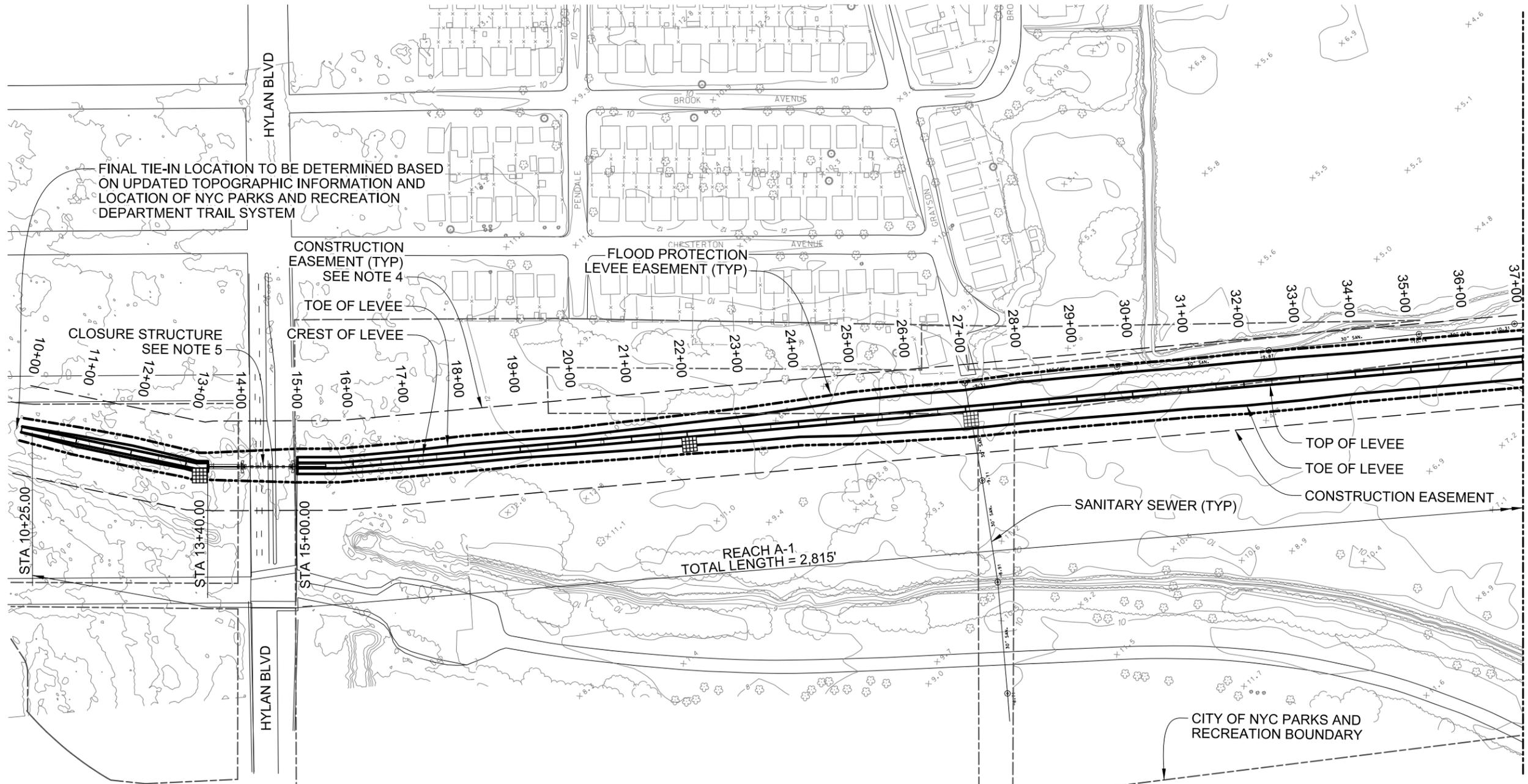
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FINAL TIE-IN LOCATION TO BE DETERMINED BASED ON UPDATED TOPOGRAPHIC INFORMATION AND LOCATION OF NYC PARKS AND RECREATION DEPARTMENT TRAIL SYSTEM

CONSTRUCTION EASEMENT (TYP) SEE NOTE 4

FLOOD PROTECTION LEVEE EASEMENT (TYP)

CLOSURE STRUCTURE SEE NOTE 5

TOE OF LEVEE

CREST OF LEVEE

TOP OF LEVEE

TOE OF LEVEE

CONSTRUCTION EASEMENT

SANITARY SEWER (TYP)

REACH A-1
TOTAL LENGTH = 2,815'

CITY OF NYC PARKS AND RECREATION BOUNDARY

MATCH LINE - SEE SHEET C-101

NOTES

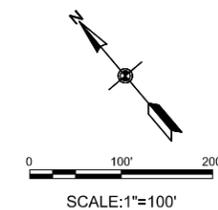
1. TYPICAL SECTIONS SHOWN ON SHEETS C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
3. STRUCTURE LIMITS SHOWN FOR LEVEL OF PROTECTION ARE BASED ON THE 15.6 FT SWL.
4. CONSTRUCTION EASEMENT LINE @ 50' OFFSET TO PROPOSED STRUCTURES.
5. CLOSURE STRUCTURE ON SHEETS C-515 & C-516.
6. SANITARY SERVICE ROAD SECTION SHOWN ON SHEET C-507.
7. THE LINE OF PROTECTION (LOP) STRUCTURES WITHIN THE OAKWOOD BEACH CORRIDOR HAVE BEEN DESIGNED TO ACCOMMODATE THE CITY OF NEW YORK'S STATEN ISLAND BLUEBELT PLAN.

LEGEND

- PA PEDESTRIAN ACCESS STAIRS SEE SHEET C-509
- DTP COMBINED TRUCK & PEDESTRIAN ACCESS RAMP, SEE SHEET C-510
- MVA MAINTENANCE VEHICLE ACCESS RAMP, SEE SHEET C-510
- BA BOARDWALK ACCESS SEE SHEET C-508
- Drainage Control Structure, SEE SHEET C-512
- SANITARY/DRAINAGE CONTROL STRUCTURE SEE SHEET C-514
- TG TIDE GATE SEE SHEET C-513
- 30" SAN. SANITARY SEWER
- MAJOR STORM SEWER OUTFALL
- SAND COVER
- BOARDWALK SEE SHEET C-507
- PROMENADE SEE SHEET C-504



KEY PLAN



SCALE: 1"=100'

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NO.	REVISIONS FOR AIR COMMENTS	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS U.S. ARMY ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil	ISSUED BY: DANA	DATE: 03/01/16	SUBMITTED BY: MARK PIRELO	CONTRACT NO.:	FILE NUMBER:
MODFATT & NICHOL 529 9th Avenue, 14th Floor New York, New York 10017 212-768-7454	DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS U.S. ARMY ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil	ISSUED BY: DANA	DATE: 03/01/16	SUBMITTED BY: MARK PIRELO	CONTRACT NO.:
	ISSUED BY: DANA	DATE: 03/01/16	SUBMITTED BY: MARK PIRELO	CONTRACT NO.:	FILE NUMBER:

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SITE PLAN (1 OF 11)
SHEET IDENTIFICATION
C-100

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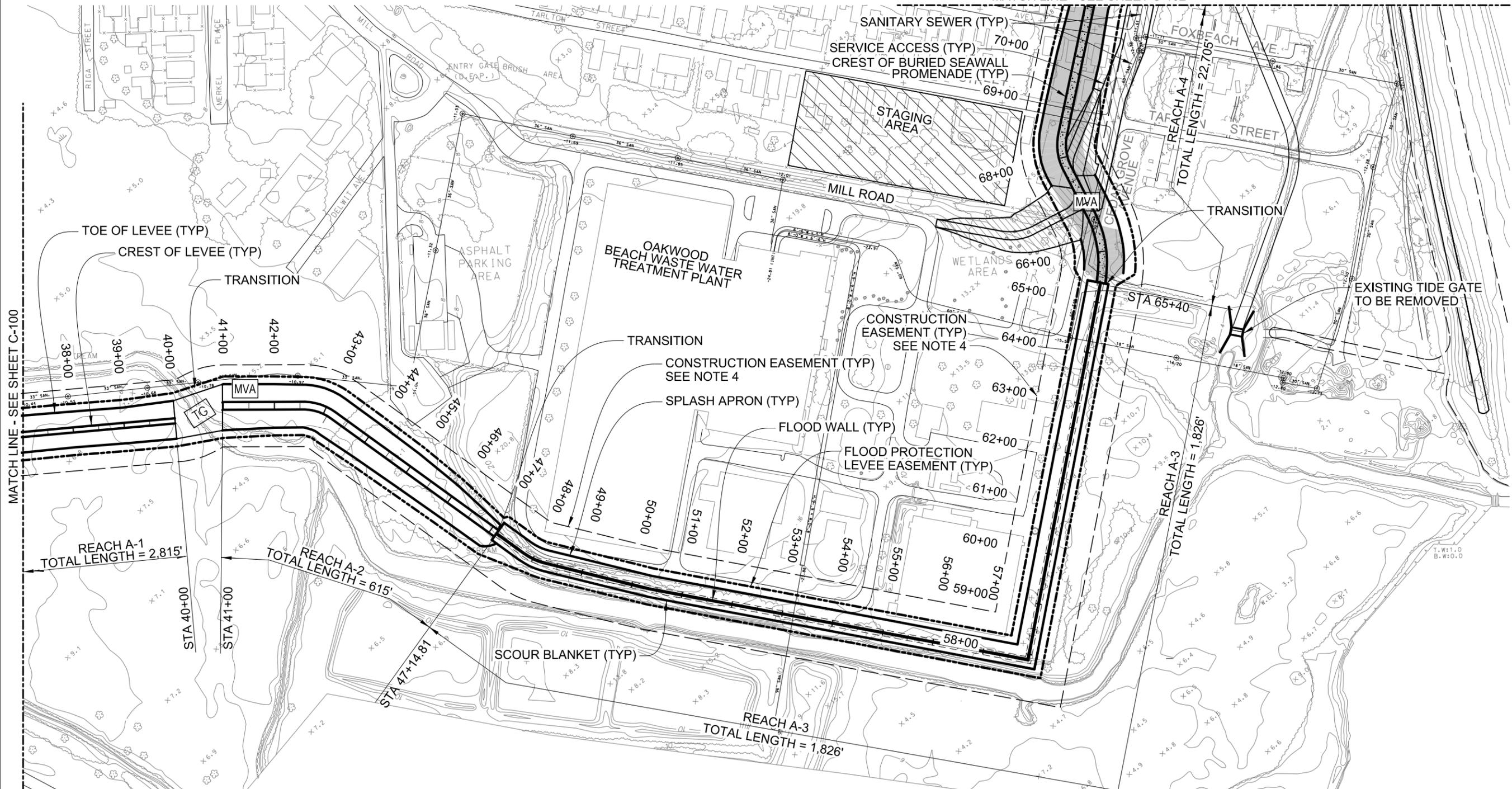
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US Army Corps of Engineers

MATCH LINE - SEE SHEET C-102



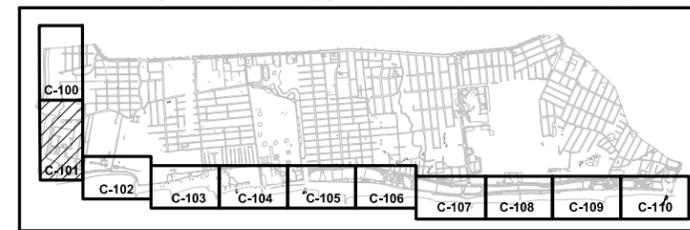
NOTES

- 1. TYPICAL SECTIONS SHOWN ON SHEETS C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
3. STRUCTURE LIMITS SHOWN FOR LEVEL OF PROTECTION ARE BASED ON THE 15.6 FT SWL.
4. CONSTRUCTION EASEMENT LINE @ 50' OFFSET TO PROPOSED STRUCTURES.
5. CLOSURE STRUCTURE ON SHEETS C-515 & C-516.
6. SANITARY SERVICE ROAD SECTION SHOWN ON SHEET C-507.
7. THE LINE OF PROTECTION (LOP) STRUCTURES WITHIN THE OAKWOOD BEACH CORRIDOR HAVE BEEN DESIGNED TO ACCOMMODATE THE CITY OF NEW YORK'S STATEN ISLAND BLUEBELT PLAN.

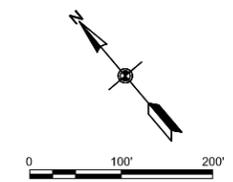
LEGEND

- PA PEDESTRIAN ACCESS STAIRS
DTP COMBINED TRUCK & PEDESTRIAN ACCESS RAMP
MVA MAINTENANCE VEHICLE ACCESS RAMP
BA BOARDWALK ACCESS
X DRAINAGE CONTROL STRUCTURE
SANITARY/DRAINAGE CONTROL STRUCTURE
TG TIDE GATE
SANITARY SEWER
MAJOR STORM SEWER OUTFALL
SAND COVER
BOARDWALK
PROMENADE

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KEY PLAN



SCALE: 1"=100'

Table with columns: DATE, REVISIONS FOR OUR COMMENTS, DESCRIPTION, DATE, APPR. Includes revision 1 for 'INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS'.

Table with columns: DESIGNED BY, DRAWN BY, CHECKED BY, SUBMITTED BY, PLOT SCALE, PLOT DATE, FILE NUMBER, FILE NAME. Includes project details for US Army Corps of Engineers.

COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND

SHEET IDENTIFICATION C-101 OF 11

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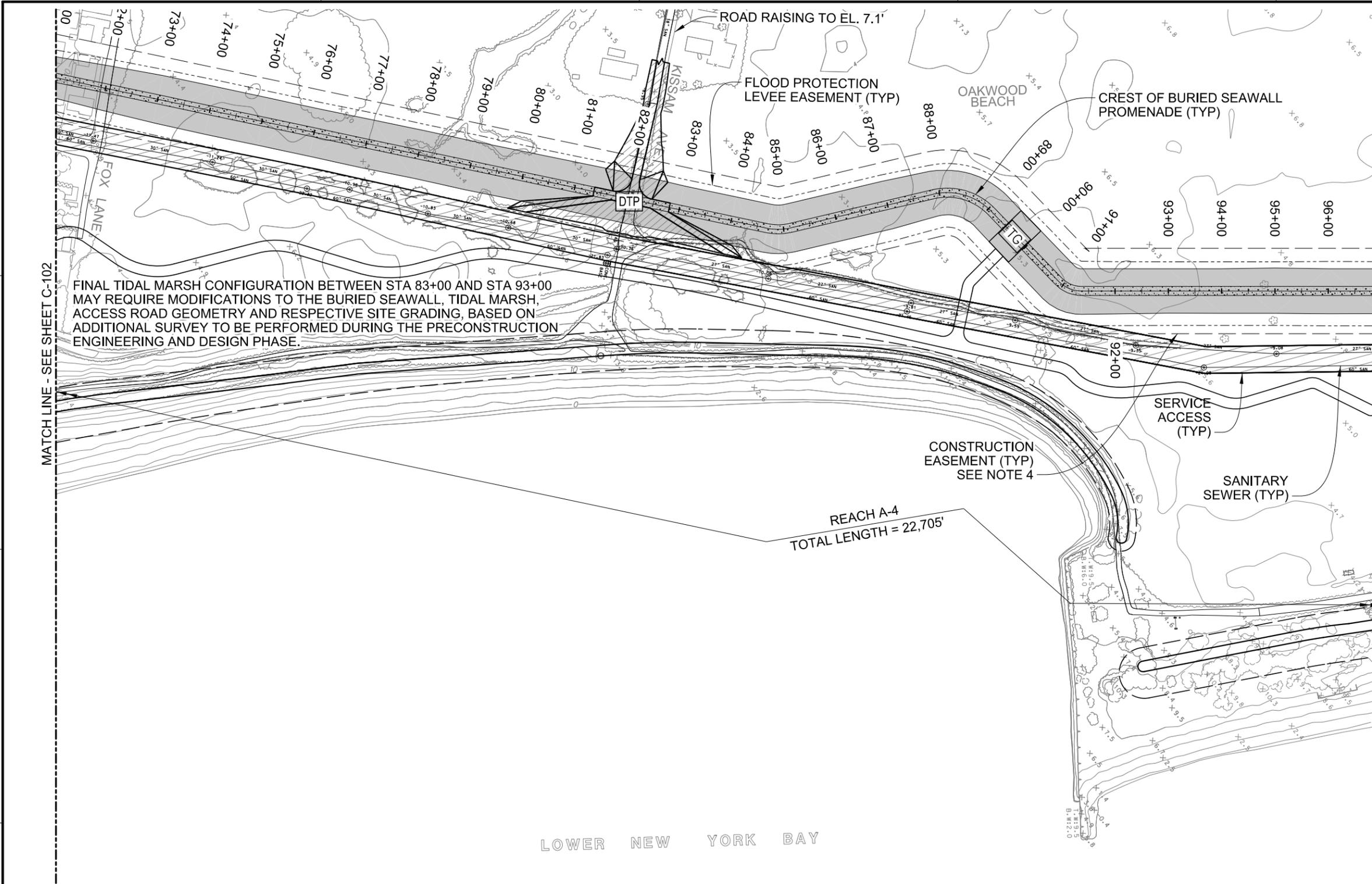
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LAST PLOTTED BY:

MATCH LINE - SEE SHEET C-102

MATCH LINE - SEE SHEET C-103

FINAL TIDAL MARSH CONFIGURATION BETWEEN STA 83+00 AND STA 93+00 MAY REQUIRE MODIFICATIONS TO THE BURIED SEAWALL, TIDAL MARSH, ACCESS ROAD GEOMETRY AND RESPECTIVE SITE GRADING, BASED ON ADDITIONAL SURVEY TO BE PERFORMED DURING THE PRECONSTRUCTION ENGINEERING AND DESIGN PHASE.



LOWER NEW YORK BAY

NOTES

- 1. TYPICAL SECTIONS SHOWN ON SHEETS C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
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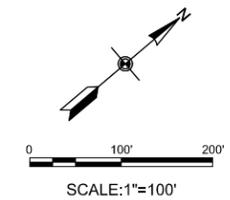
LEGEND

- PA PEDESTRIAN ACCESS STAIRS SEE SHEET C-509
DTP COMBINED TRUCK & PEDESTRIAN ACCESS RAMP, SEE SHEET C-510
MVA MAINTENANCE VEHICLE ACCESS RAMP, SEE SHEET C-510
BA BOARDWALK ACCESS SEE SHEET C-508
DRAINAGE CONTROL STRUCTURE, SEE SHEET C-512
SANITARY/DRAINAGE CONTROL STRUCTURE SEE SHEET C-514
TG TIDE GATE SEE SHEET C-513
30" SAN. -4.71' SANITARY SEWER
W X H (510) MAJOR STORM SEWER OUTFALL
SAND COVER
BOARDWALK SEE SHEET C-507
PROMENADE SEE SHEET C-504

FINAL JUNE 2016 NOT FOR CONSTRUCTION



KEY PLAN



US Army Corps of Engineers

Table with columns for DATE, DESCRIPTION, and MARK. Includes revision history for MAP and APRR.

Table with columns for U.S. ARMY CORPS OF ENGINEERS, U.S. ARMY ENGINEER DISTRICT, NEW YORK, and project details like CONTRACT NO. and FILE NUMBER.

COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND

SHEET IDENTIFICATION C-102

SITE PLAN (3 OF 11)

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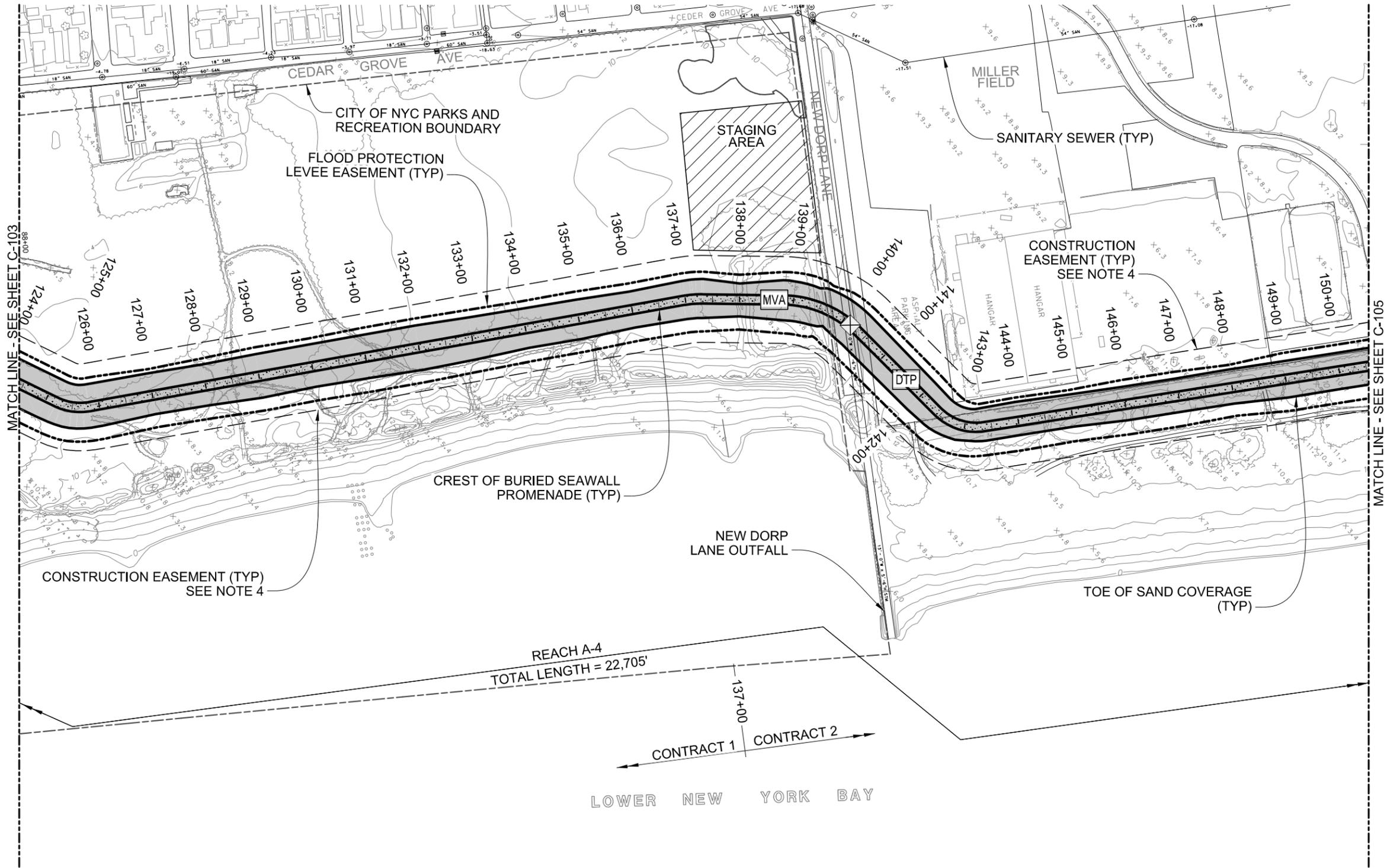
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MATCH LINE - SEE SHEET C-103

MATCH LINE - SEE SHEET C-105

REACH A-4
TOTAL LENGTH = 22,705'

CONTRACT 1 CONTRACT 2

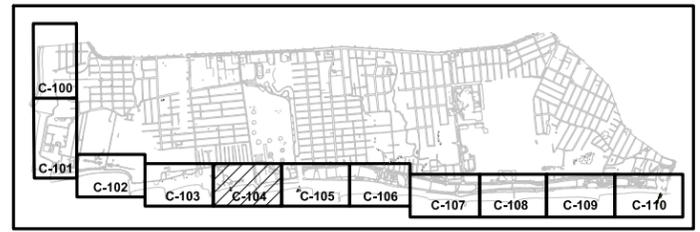
LOWER NEW YORK BAY

NOTES

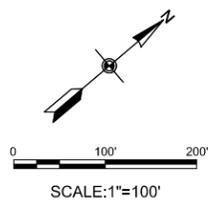
1. TYPICAL SECTIONS SHOWN ON SHEETS C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
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4. CONSTRUCTION EASEMENT LINE @ 50' OFFSET TO PROPOSED STRUCTURES.
5. CLOSURE STRUCTURE ON SHEETS C-515 & C-516.
6. SANITARY SERVICE ROAD SECTION SHOWN ON SHEET C-507.
7. THE LINE OF PROTECTION (LOP) STRUCTURES WITHIN THE OAKWOOD BEACH CORRIDOR HAVE BEEN DESIGNED TO ACCOMMODATE THE CITY OF NEW YORK'S STATEN ISLAND BLUEBELT PLAN.

LEGEND

- PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509
- COMBINED TRUCK & PEDESTRIAN
ACCESS RAMP, SEE SHEET C-510
- MAINTENANCE VEHICLE ACCESS
RAMP, SEE SHEET C-510
- BOARDWALK ACCESS
SEE SHEET C-508
- DRAINAGE CONTROL STRUCTURE,
SEE SHEET C-512
- SANITARY/DRAINAGE CONTROL
STRUCTURE SEE SHEET C-514
- TIDE GATE
SEE SHEET C-513
- SANITARY SEWER
- MAJOR STORM
SEWER OUTFALL
- SAND COVER
- BOARDWALK
SEE SHEET C-507
- PROMENADE
SEE SHEET C-504



KEY PLAN



SCALE: 1"=100'

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NO.	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/21/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP
			MARK

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS NEW YORK	DESIGNED BY: C/SJ BY: MAP	DATE: 06/01/16	SOLICITATION NO.:
U.S. ARMY CORPS OF ENGINEERS U.S. ARMY ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil	FORN BY: C/SJ BY: MAP	DATE: 06/01/16	CONTRACT NO.:
MOFFATT & NICHOL 529 9th Avenue, 14th Floor New York, New York 10017 212-768-7454	DATE: 06/01/16	DATE: 06/01/16	FILE NUMBER:
	DATE: 06/01/16	DATE: 06/01/16	FILE NUMBER:

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SHEET
IDENTIFICATION
C-104
SHEET OF

SITE PLAN (5 OF 11)

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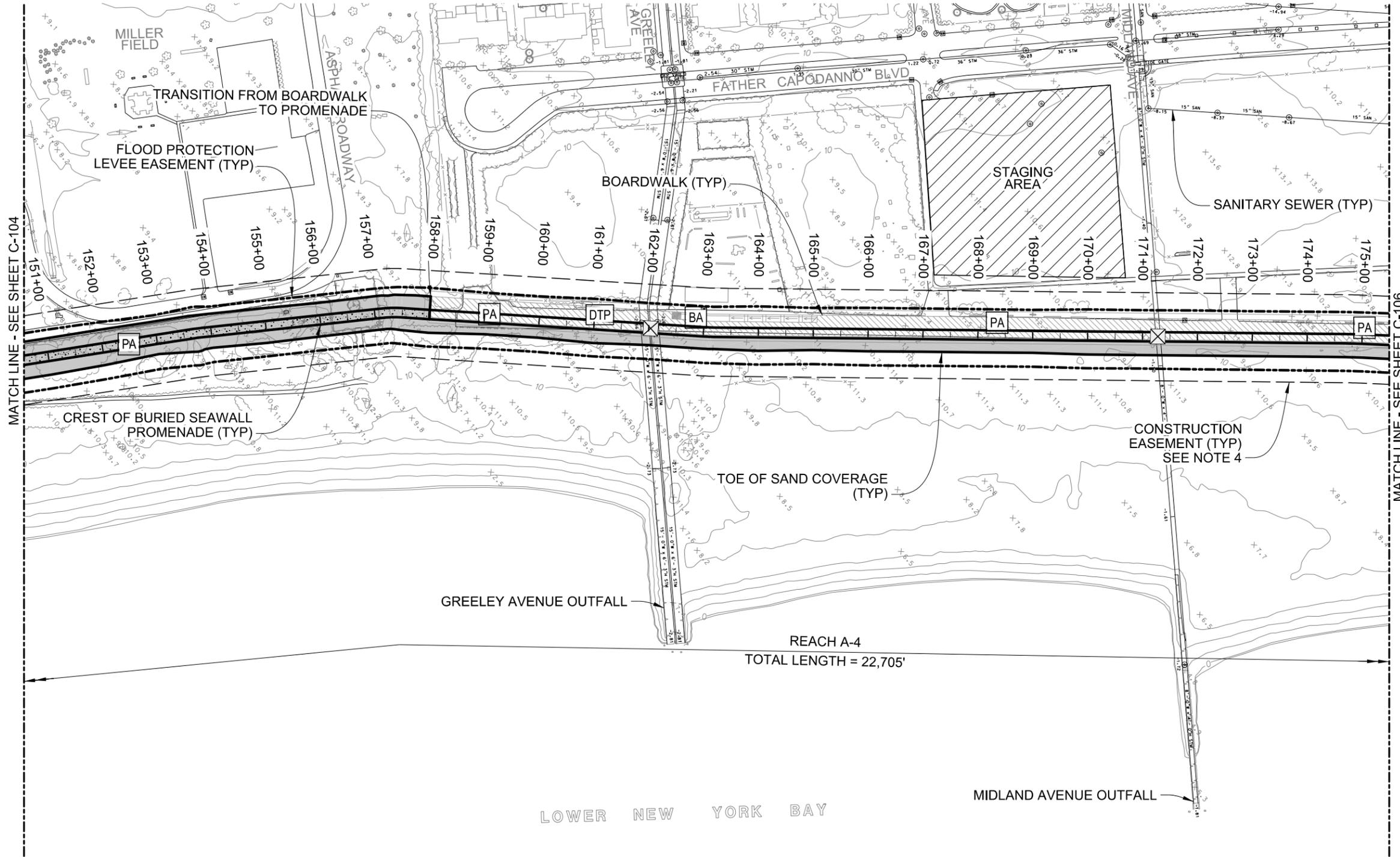
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MATCH LINE - SEE SHEET C-104

MATCH LINE - SEE SHEET C-106

NOTES

1. TYPICAL SECTIONS SHOWN ON SHEETS C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
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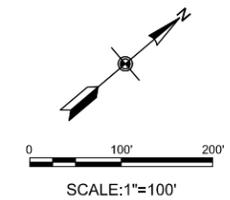
LEGEND

- PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509
- COMBINED TRUCK & PEDESTRIAN ACCESS RAMP, SEE SHEET C-510
- MAINTENANCE VEHICLE ACCESS RAMP, SEE SHEET C-510
- BOARDWALK ACCESS
SEE SHEET C-508
- DRAINAGE CONTROL STRUCTURE,
SEE SHEET C-512
- SANITARY/DRAINAGE CONTROL STRUCTURE
SEE SHEET C-514
- TIDE GATE
SEE SHEET C-513
- 30" SAN. 4.71' SANITARY SEWER
- MAJOR STORM SEWER OUTFALL
- SAND COVER
- BOARDWALK
SEE SHEET C-507
- PROMENADE
SEE SHEET C-504

FINAL JUNE 2016
NOT FOR CONSTRUCTION



KEY PLAN



SCALE: 1"=100'



US Army Corps of Engineers®

NO.	DATE	DESCRIPTION
2	3/21/2016	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS
1	1/9/2015	REVISIONS FOR OUR COMMENTS

DATE	DESIGNED BY:	DESIGNED BY:	DESIGNED BY:	DESIGNED BY:
11/08/11	DMK	DMK	DMK	DMK
XXXX	MAP	MAP	MAP	MAP
XXXX	MARK	MARK	MARK	MARK
XXXX	FILE NUMBER:	FILE NUMBER:	FILE NUMBER:	FILE NUMBER:
XXXX	XXXX	XXXX	XXXX	XXXX

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK
http://www.nan.usace.army.mil

DESIGNED BY: DMK
DRAWN BY: DMK
CHECKED BY: DMK
DATE: 11/08/11

CONTRACT NO.: XXXX
FILE NUMBER: XXXX

PILOT DATE: 6/2/2016
SCALE: 1:200
SIZE: ANSI D
FILE NAME: 698705C-105.dgn

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SITE PLAN (6 OF 11)

SHEET IDENTIFICATION
C-105

PATH: Q:\TA\6987-05\cadd\Active_Preliminary\

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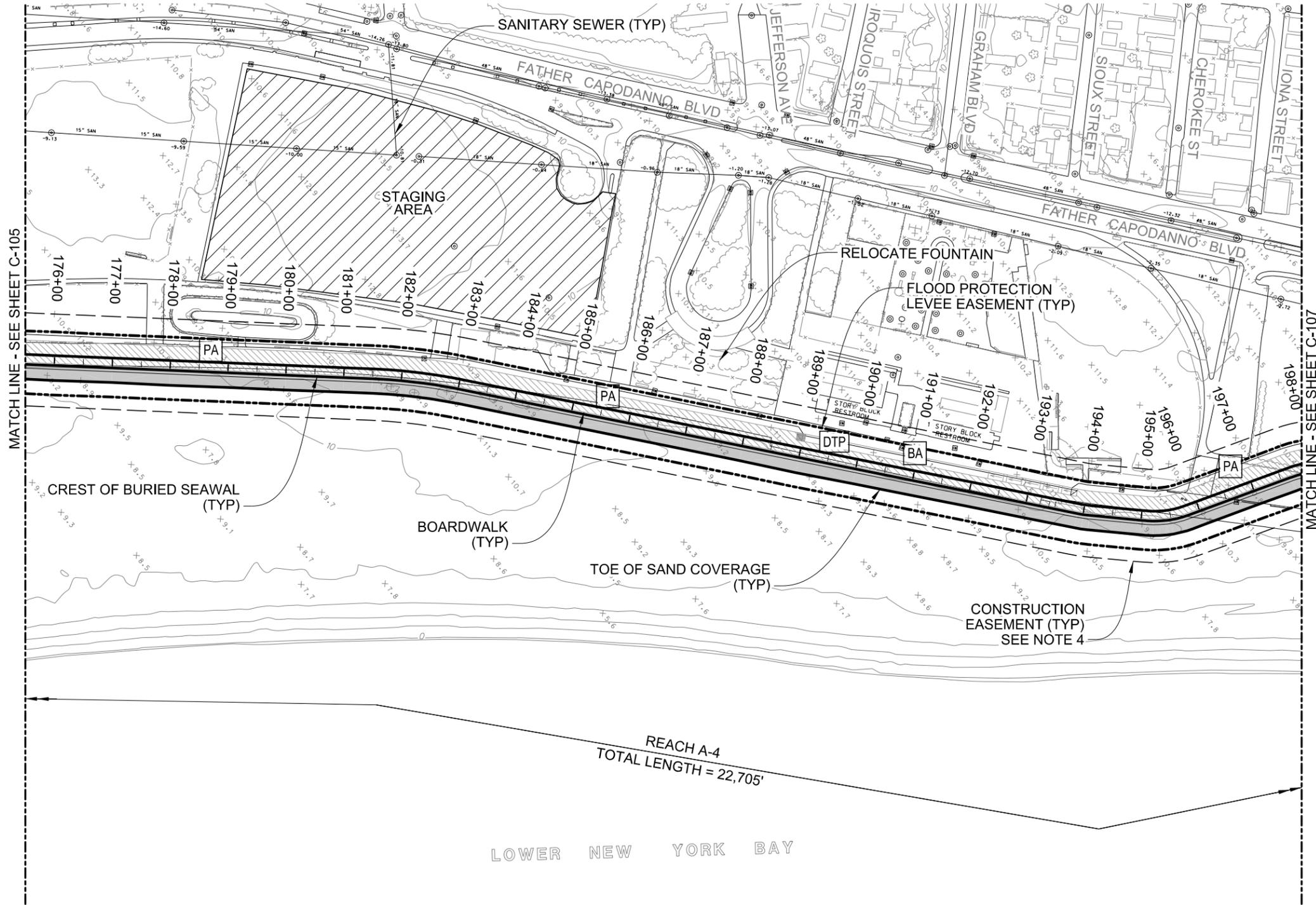
1

2

3

4

5



REACH A-4
TOTAL LENGTH = 22,705'

LOWER NEW YORK BAY

NOTES

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5. CLOSURE STRUCTURE ON SHEETS C-515 & C-516.
6. SANITARY SERVICE ROAD SECTION SHOWN ON SHEET C-507.
7. THE LINE OF PROTECTION (LOP) STRUCTURES WITHIN THE OAKWOOD BEACH CORRIDOR HAVE BEEN DESIGNED TO ACCOMMODATE THE CITY OF NEW YORK'S STATEN ISLAND BLUEBELT PLAN.

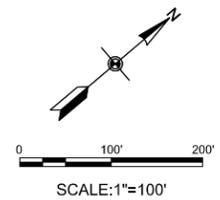
LEGEND

- PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509
- COMBINED TRUCK & PEDESTRIAN ACCESS RAMP. SEE SHEET C-510
- MAINTENANCE VEHICLE ACCESS RAMP. SEE SHEET C-510
- BOARDWALK ACCESS
SEE SHEET C-508
- DRAINAGE CONTROL STRUCTURE, SEE SHEET C-512
- SANITARY/DRAINAGE CONTROL STRUCTURE SEE SHEET C-514
- TIDE GATE
SEE SHEET C-513
- SANITARY SEWER
- MAJOR STORM SEWER OUTFALL
- SAND COVER
- BOARDWALK
SEE SHEET C-507
- PROMENADE
SEE SHEET C-504

FINAL JUNE 2016
NOT FOR CONSTRUCTION



KEY PLAN



US Army Corps
of Engineers®

NO.	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/21/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP
			MARK

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS NEW YORK	ISSUED BY: DMM	DATE: 06/01/16
FORN BY: DMM	MAP	
SUBMITTED BY: MARK PIRELLO	CONTRACT NO.:	FILE NUMBER:
PLOT SCALE: 1:200	PILOT DATE: 6/2/2016	FILE NAME: 698705C-106.dgn
SIZE: ANSI D		

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SHEET
IDENTIFICATION
C-106
SHEET OF

SITE PLAN (7 OF 11)

PATH: Q:\TA\6987-05\cadd\Active_Preliminary\

FILE: 698705C-107.dgn

6/2/2016

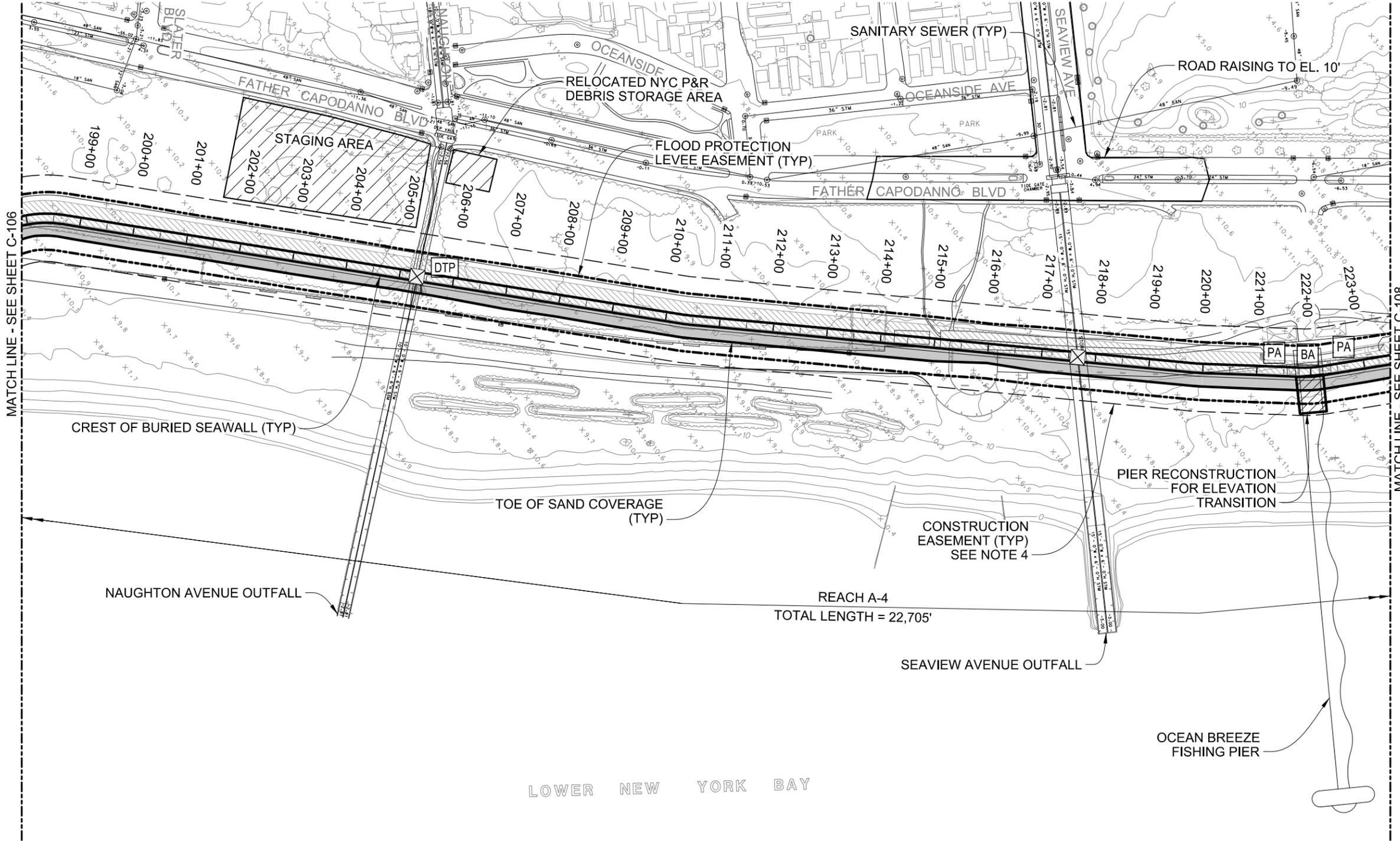
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arsmith

LAST PLOTTED BY:

MATCH LINE - SEE SHEET C-106

MATCH LINE - SEE SHEET C-108



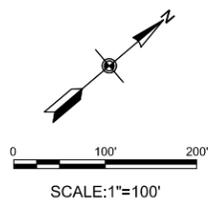
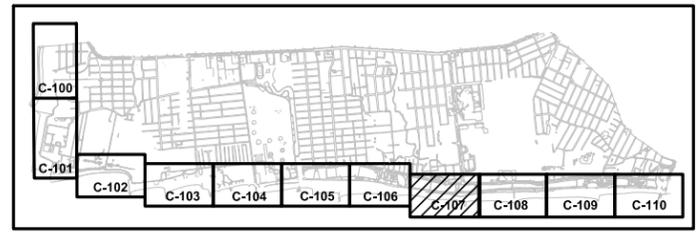
NOTES

1. TYPICAL SECTIONS SHOWN ON SHEETS C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
3. STRUCTURE LIMITS SHOWN FOR LEVEL OF PROTECTION ARE BASED ON THE 15.6 FT SWL.
4. CONSTRUCTION EASEMENT LINE @ 50' OFFSET TO PROPOSED STRUCTURES.
5. CLOSURE STRUCTURE ON SHEETS C-515 & C-516.
6. SANITARY SERVICE ROAD SECTION SHOWN ON SHEET C-507.
7. THE LINE OF PROTECTION (LOP) STRUCTURES WITHIN THE OAKWOOD BEACH CORRIDOR HAVE BEEN DESIGNED TO ACCOMMODATE THE CITY OF NEW YORK'S STATEN ISLAND BLUEBELT PLAN.

LEGEND

- PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509
- COMBINED TRUCK & PEDESTRIAN
ACCESS RAMP. SEE SHEET C-510
- MAINTENANCE VEHICLE ACCESS
RAMP, SEE SHEET C-510
- BOARDWALK ACCESS
SEE SHEET C-508
- DRAINAGE CONTROL STRUCTURE,
SEE SHEET C-512
- SANITARY/DRAINAGE CONTROL
STRUCTURE SEE SHEET C-514
- TIDE GATE
SEE SHEET C-513
- SANITARY SEWER
- MAJOR STORM
SEWER OUTFALL
- SAND COVER
- BOARDWALK
SEE SHEET C-507
- PROMENADE
SEE SHEET C-504

FINAL JUNE 2016
NOT FOR CONSTRUCTION



DATE	DESCRIPTION
3/2/2016	MAP
1/9/2015	MAP
	DATE

2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	MAP	3/2/2016
1	REVISIONS FOR AIR COMMENTS	MAP	1/9/2015
		DATE	

DESIGNED BY:	DATE:	SUBMITTED BY:	DATE:
U.S. ARMY CORPS OF ENGINEERS	6/2/2016	U.S. ARMY ENGINEER DISTRICT	6/2/2016
NEW YORK		NEW YORK	
http://www.nan.usace.army.mil		http://www.nan.usace.army.mil	
MOFFATT & NICHOL		MOFFATT & NICHOL	
529 5th Avenue, 14th Floor		529 5th Avenue, 14th Floor	
New York, New York 10017		New York, New York 10017	
212-768-7454		212-768-7454	

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SITE PLAN (8 OF 11)

SHEET
IDENTIFICATION
C-107
SHEET OF

PATH: Q:\TA\16987-05\cadd\Active_Preliminary\

FILE: 698705C-109.dgn

6/2/2016

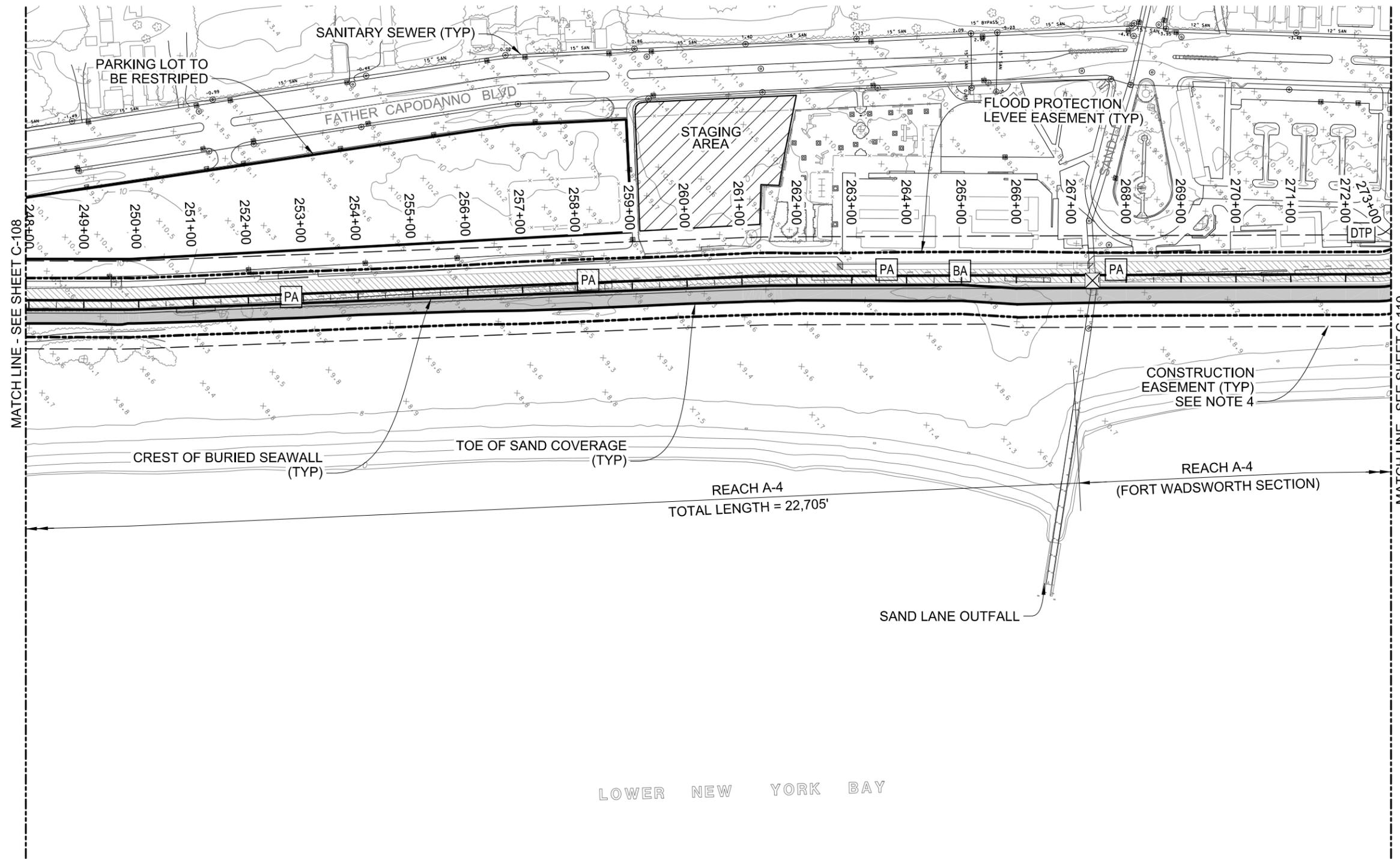
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arsmith

LAST PLOTTED BY:

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MATCH LINE - SEE SHEET C-110



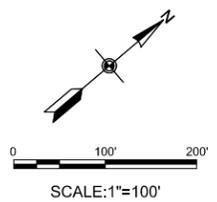
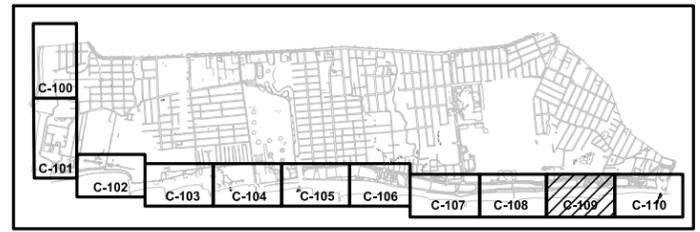
NOTES

1. TYPICAL SECTIONS SHOWN ON SHEETS C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
3. STRUCTURE LIMITS SHOWN FOR LEVEL OF PROTECTION ARE BASED ON THE 15.6 FT SWL.
4. CONSTRUCTION EASEMENT LINE @ 50' OFFSET TO PROPOSED STRUCTURES.
5. CLOSURE STRUCTURE ON SHEETS C-515 & C-516.
6. SANITARY SERVICE ROAD SECTION SHOWN ON SHEET C-507.
7. THE LINE OF PROTECTION (LOP) STRUCTURES WITHIN THE OAKWOOD BEACH CORRIDOR HAVE BEEN DESIGNED TO ACCOMMODATE THE CITY OF NEW YORK'S STATEN ISLAND BLUEBELT PLAN.

LEGEND

- PA** PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509
- DTP** COMBINED TRUCK & PEDESTRIAN ACCESS RAMP, SEE SHEET C-510
- MVA** MAINTENANCE VEHICLE ACCESS RAMP, SEE SHEET C-510
- BA** BOARDWALK ACCESS
SEE SHEET C-508
- ⊗** DRAINAGE CONTROL STRUCTURE, SEE SHEET C-512
- ⊠** SANITARY/DRAINAGE CONTROL STRUCTURE SEE SHEET C-514
- TG** TIDE GATE
SEE SHEET C-513
- ⊙** 30" SAN. SANITARY SEWER
-4.71
- ⊠** MAJOR STORM SEWER OUTFALL
- SAND COVER
- ▨** BOARDWALK
SEE SHEET C-507
- ⊠** PROMENADE
SEE SHEET C-504

FINAL JUNE 2016
NOT FOR CONSTRUCTION



NO.	REVISIONS FOR OUR COMMENTS	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/21/2016	MAP
1	REVISIONS FOR OUR COMMENTS	1/9/2015	MAP

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS NEW YORK	DATE: 06/01/16	SUBMITTED BY: MARK PIRELLO	CONTRACT NO.:
FORN BY: DANA MAP	FILE NUMBER: XXXX	DESIGNED BY: DANA MAP	CONTRACT NO.:
FORN BY: DANA MAP	FILE NUMBER: XXXX	DESIGNED BY: DANA MAP	CONTRACT NO.:

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SITE PLAN (10 OF 11)

SHEET IDENTIFICATION
C-109

PATH: Q:\TA\6987-05\cadd\Active_Preliminary\

FILE: 698705C-110.dgn

6/2/2016

3:13:55 PM

ar smith

LAST PLOTTED BY:

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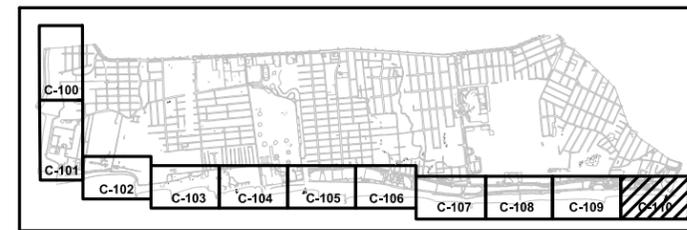
FINAL JUNE 2016
NOT FOR CONSTRUCTION

NOTES

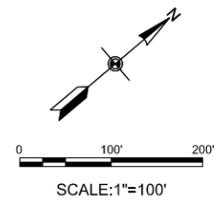
1. TYPICAL SECTIONS SHOWN ON SHEETS C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
3. STRUCTURE LIMITS SHOWN FOR LEVEL OF PROTECTION ARE BASED ON THE 15.6 FT SWL.
4. CONSTRUCTION EASEMENT LINE @ 50' OFFSET TO PROPOSED STRUCTURES.
5. CLOSURE STRUCTURE ON SHEETS C-515 & C-516.
6. SANITARY SERVICE ROAD SECTION SHOWN ON SHEET C-507.
7. THE LINE OF PROTECTION (LOP) STRUCTURES WITHIN THE OAKWOOD BEACH CORRIDOR HAVE BEEN DESIGNED TO ACCOMMODATE THE CITY OF NEW YORK'S STATEN ISLAND BLUEBELT PLAN.

LEGEND

- | | | | |
|-----|-------------------------------------------------------------|--|------------------------------|
| PA | PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509 | | SANITARY SEWER |
| DTP | COMBINED TRUCK & PEDESTRIAN
ACCESS RAMP, SEE SHEET C-510 | | MAJOR STORM
SEWER OUTFALL |
| MVA | MAINTENANCE VEHICLE ACCESS
RAMP, SEE SHEET C-510 | | SAND COVER |
| BA | BOARDWALK ACCESS
SEE SHEET C-508 | | BOARDWALK
SEE SHEET C-507 |
| | DRAINAGE CONTROL STRUCTURE,
SEE SHEET C-512 | | PROMENADE
SEE SHEET C-504 |
| | SANITARY/DRAINAGE CONTROL
STRUCTURE SEE SHEET C-514 | | |
| TG | TIDE GATE
SEE SHEET C-513 | | |



KEY PLAN



SCALE: 1"=100'



US Army Corps
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MARK	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/21/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS NEW YORK http://www.nan.usace.army.mil	DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS NEW YORK http://www.nan.usace.army.mil	DATE: 12/01/11	DATE: 12/01/11
FORN BY: DMM	FORN BY: DMM	SOLICITATION NO.:	SOLICITATION NO.:
MARK: PIRELO	MARK: PIRELO	CONTRACT NO.:	CONTRACT NO.:
FILE NAME: 698705C-110.dgn	FILE NAME: 698705C-110.dgn	FILE NUMBER:	FILE NUMBER:

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SITE PLAN (11 OF 11)

SHEET
IDENTIFICATION
C-110
SHEET OF

PATH: Q:\TA\6987-05\cadd\Active_Preliminary\

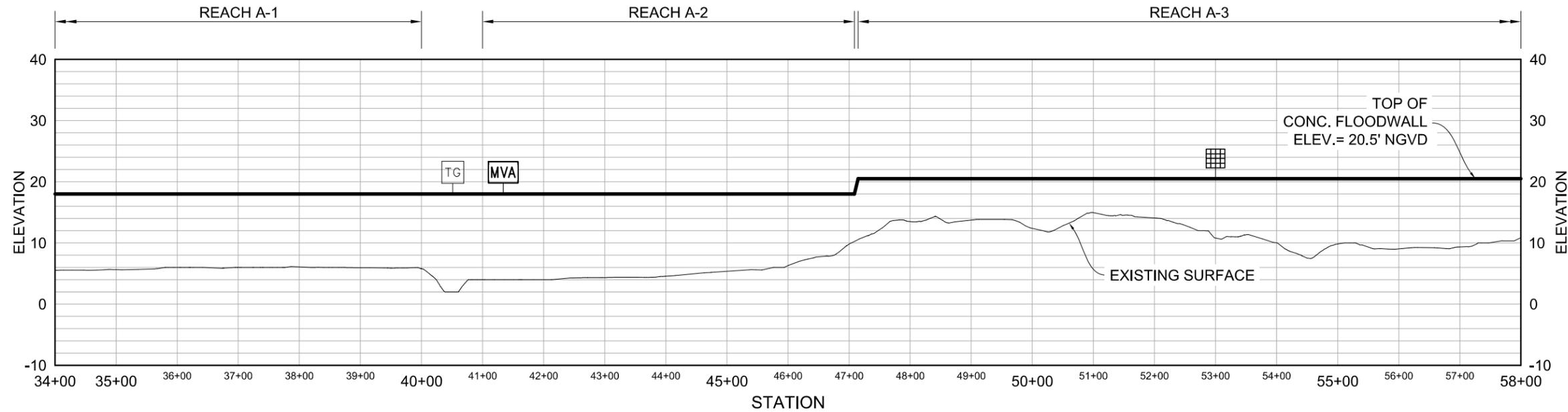
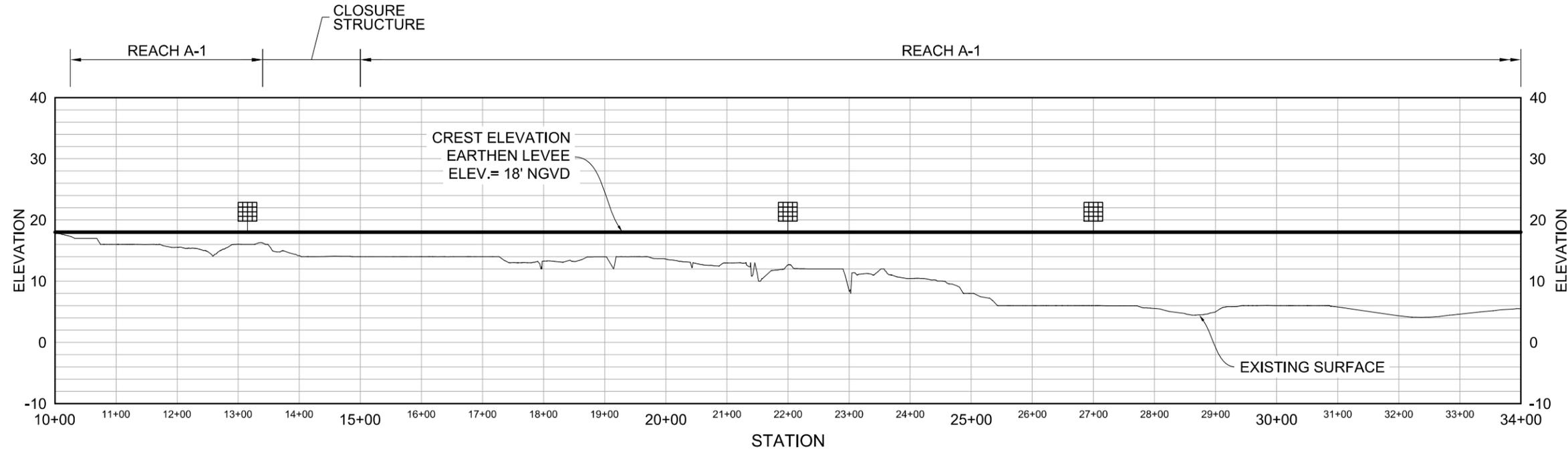
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6/2/2016

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arsmith

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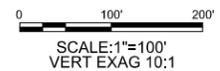
NOTE

1. TYPICAL SECTIONS SHOWN ON C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
3. PROFILES FOR 15.6 FT SWL CALCULATED ALONG BASELINE. REFER TO SITE PLANS FOR BASELINE LOCATION.
4. CLOSURE STRUCTURE ON SHEETS C-515 & C-516.

LEGEND

- PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509
- COMBINED TRUCK & PEDESTRIAN
ACCESS RAMP, SEE SHEET C-510
- MAINTENANCE VEHICLE ACCESS
RAMP, SEE SHEET C-510
- BOARDWALK ACCESS
SEE SHEET C-508
- DRAINAGE CONTROL STRUCTURE,
SEE SHEET C-512
- SANITARY/DRAINAGE CONTROL
STRUCTURE SEE SHEET C-514
- TIDE GATE
SEE SHEET C-513

FINAL JUNE 2016
NOT FOR CONSTRUCTION



US Army Corps
of Engineers®

MARK	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS NEW YORK	ISSUED BY: U.S. ARMY CORPS OF ENGINEERS NEW YORK	DATE: 06/01/16	SUBMITTED BY: MARK PIRELLO	CONTRACT NO.:	FILE NUMBER:
U.S. ARMY CORPS OF ENGINEERS NEW YORK http://www.nan.usace.army.mil	U.S. ARMY ENGINEER DISTRICT NEW YORK	DATE: 06/01/16	MARK PIRELLO	XXXX	XXXX
MOFFATT & NICHOL 529 9th Avenue, 14th Floor New York, New York 10017 212-768-7454	U.S. ARMY CORPS OF ENGINEERS NEW YORK	DATE: 06/01/16	MARK PIRELLO	XXXX	XXXX

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SITE PROFILE (1 OF 6)

SHEET
IDENTIFICATION
C-301
SHEET OF

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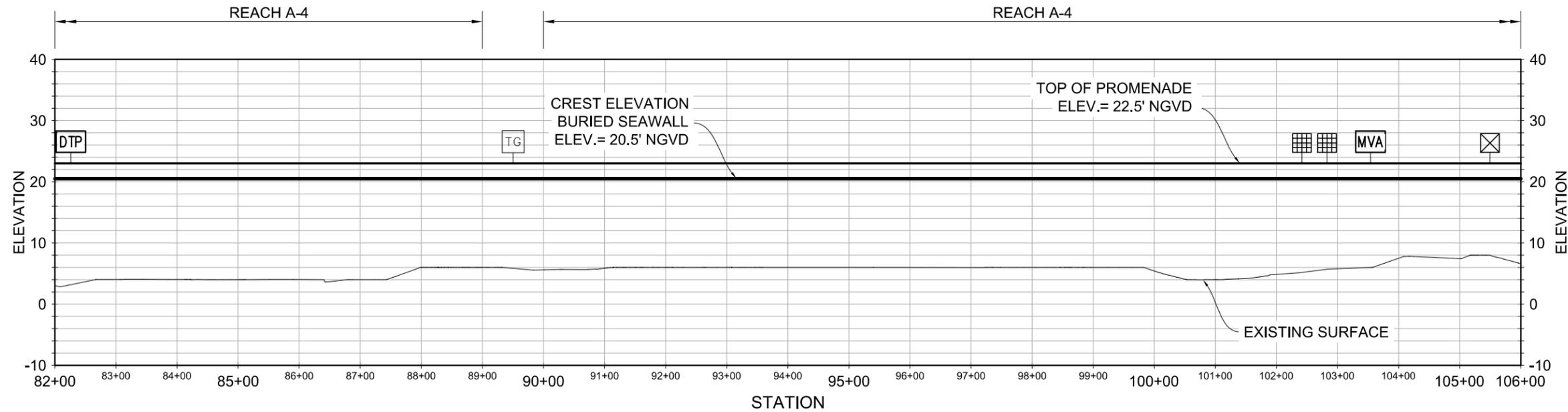
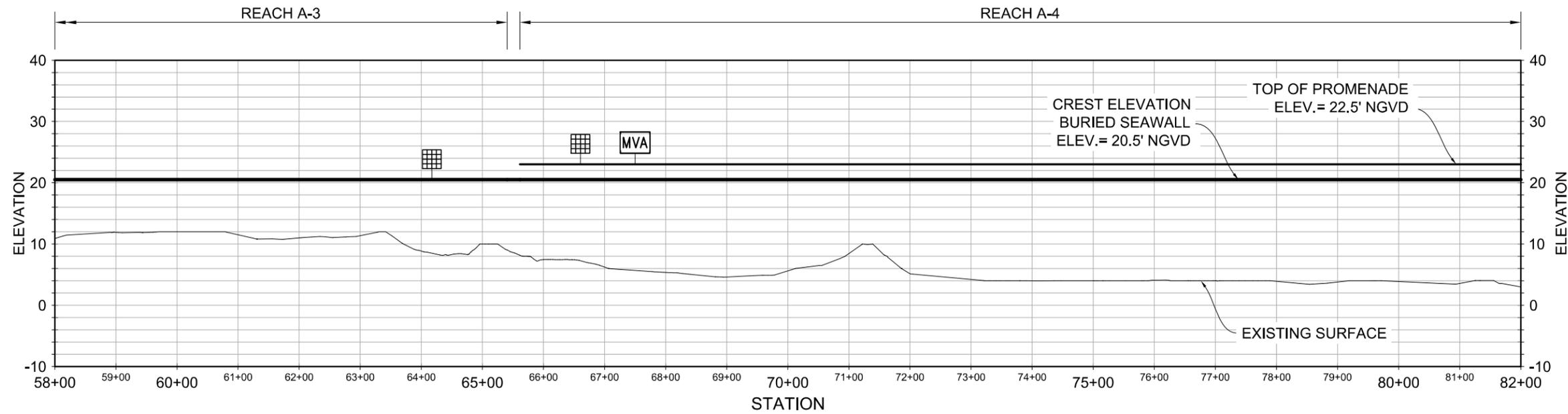
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ar smith

LAST PLOTTED BY:

SEE SHEET C-301 FOR CONTINUATION



NOTE

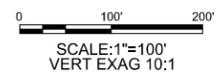
1. TYPICAL SECTIONS SHOWN ON C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
3. PROFILES FOR 15.6 FT SWL CALCULATED ALONG BASELINE. REFER TO SITE PLANS FOR BASELINE LOCATION.

SEE SHEET C-303 FOR CONTINUATION

LEGEND

- PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509
- COMBINED TRUCK & PEDESTRIAN
ACCESS RAMP. SEE SHEET C-510
- MAINTENANCE VEHICLE ACCESS
RAMP. SEE SHEET C-510
- BOARDWALK ACCESS
SEE SHEET C-508
- DRAINAGE CONTROL STRUCTURE,
SEE SHEET C-512
- SANITARY/DRAINAGE CONTROL
STRUCTURE SEE SHEET C-514
- TIDE GATE
SEE SHEET C-513

FINAL JUNE 2016
NOT FOR CONSTRUCTION



US Army Corps
of Engineers®

MARK	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS	DATE: 6/2/2016	SUBMITTED BY: MARK PIRELLO	CONTRACT NO.:
DRAWN BY: DANIEL MANN	ISSUED BY: MAP	FILE NUMBER:	
PROJECT NO.:	FILE NAME: 698705C-302.dgn	DATE:	
U.S. ARMY CORPS OF ENGINEERS NEW YORK http://www.nan.usace.army.mil	MOFFATT & NICHOL 529 9th Avenue, 14th Floor New York, New York 10017 212-768-7454	PILOT DATE: 6/2/2016	FILE NUMBER: XXXX

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SITE PROFILE (2 OF 6)

SHEET
IDENTIFICATION
C-302
SHEET OF

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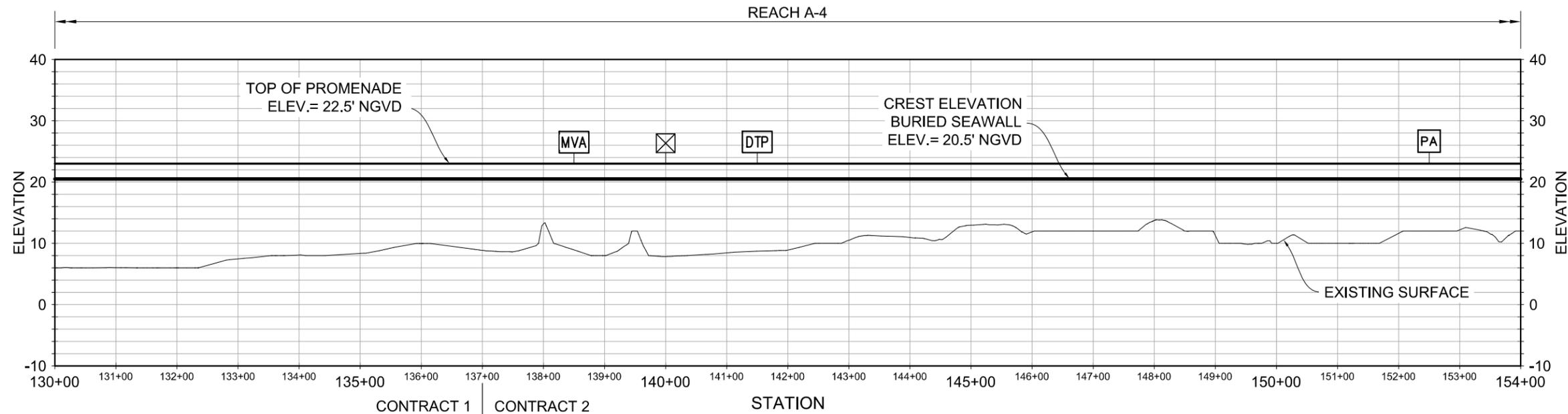
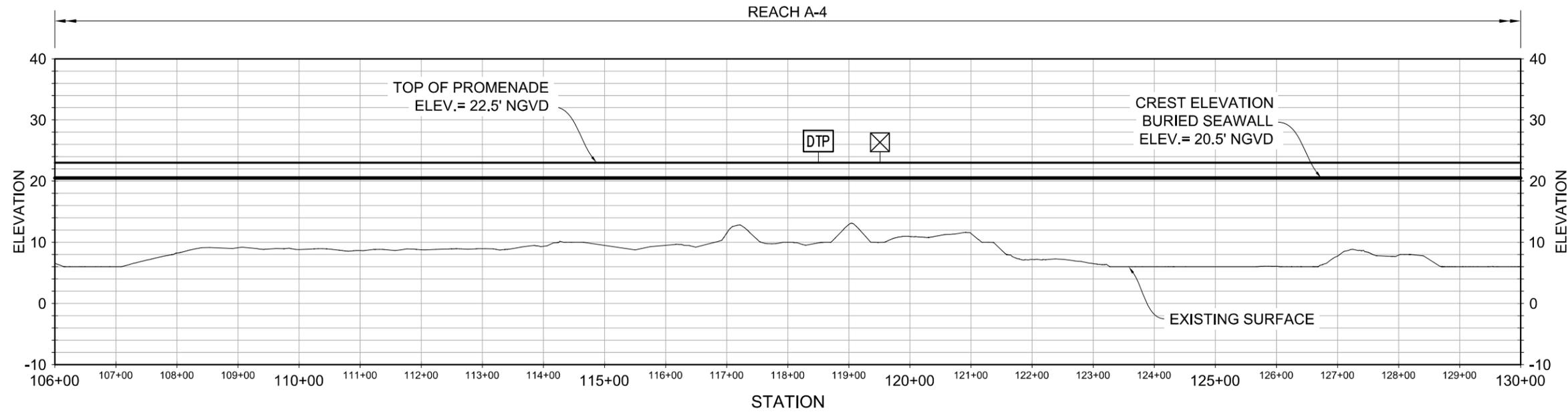
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ar smith

LAST PLOTTED BY:

SEE SHEET C-302 FOR CONTINUATION



NOTE

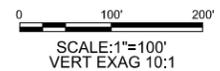
1. TYPICAL SECTIONS SHOWN ON C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
3. PROFILES FOR 15.6 FT SWL CALCULATED ALONG BASELINE. REFER TO SITE PLANS FOR BASELINE LOCATION.

SEE SHEET C-304 FOR CONTINUATION

LEGEND

- PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509
- COMBINED TRUCK & PEDESTRIAN
ACCESS RAMP, SEE SHEET C-510
- MAINTENANCE VEHICLE ACCESS
RAMP, SEE SHEET C-510
- BOARDWALK ACCESS
SEE SHEET C-508
- DRAINAGE CONTROL STRUCTURE,
SEE SHEET C-512
- SANITARY/DRAINAGE CONTROL
STRUCTURE SEE SHEET C-514
- TIDE GATE
SEE SHEET C-513

FINAL JUNE 2016
NOT FOR CONSTRUCTION



US Army Corps
of Engineers®

MARK	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS NEW YORK	ISSUED BY: DMM	DATE: 06/01/16	SUBMITTED BY: MARK PIRELLO	FILE NAME: 698705C-303.dgn
U.S. ARMY CORPS OF ENGINEERS NEW YORK	ISSUED BY: DMM	DATE: 06/01/16	FILE NUMBER: XXXX	CONTRACT NO.:
http://www.nan.usace.army.mil	ISSUED BY: DMM	DATE: 06/01/16	FILE NUMBER: XXXX	CONTRACT NO.:
MOFFATT & NICHOL 529 9th Avenue, 14th Floor New York, New York 10017 212-768-7454	ISSUED BY: DMM	DATE: 06/01/16	FILE NUMBER: XXXX	CONTRACT NO.:

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SITE PROFILE (3 OF 6)

SHEET
IDENTIFICATION
C-303
SHEET OF

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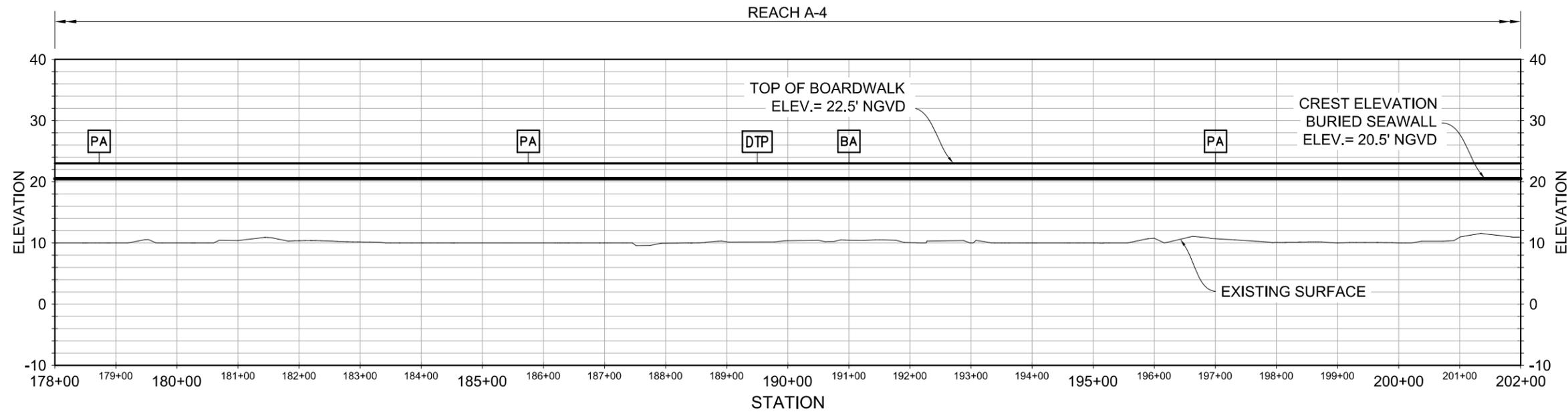
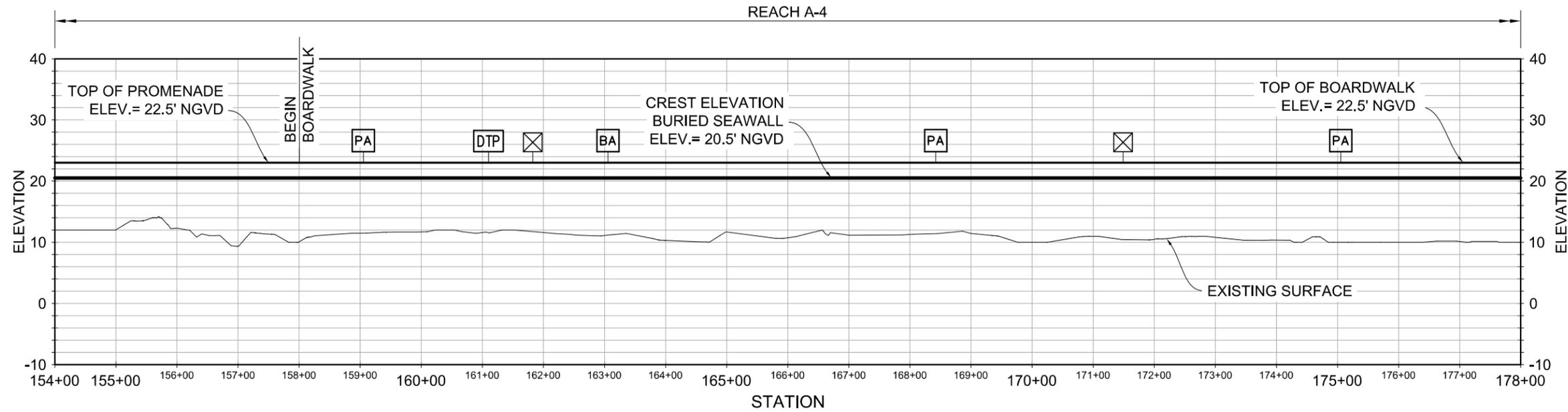
6/2/2016

3:13:58 PM

ar smith

LAST PLOTTED BY:

SEE SHEET C-303 FOR CONTINUATION



NOTE

1. TYPICAL SECTIONS SHOWN ON C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
3. PROFILES FOR 15.6 FT SWL CALCULATED ALONG BASELINE. REFER TO SITE PLANS FOR BASELINE LOCATION.

SEE SHEET C-305 FOR CONTINUATION

LEGEND

- PA PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509
- DTP COMBINED TRUCK & PEDESTRIAN
ACCESS RAMP, SEE SHEET C-510
- MVA MAINTENANCE VEHICLE ACCESS
RAMP, SEE SHEET C-510
- BA BOARDWALK ACCESS
SEE SHEET C-508
- X DRAINAGE CONTROL STRUCTURE,
SEE SHEET C-512
- [Grid] SANITARY/DRAINAGE CONTROL
STRUCTURE SEE SHEET C-514
- TG TIDE GATE
SEE SHEET C-513

FINAL JUNE 2016
NOT FOR CONSTRUCTION



US Army Corps
of Engineers®

NO.	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/21/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP
			MARK

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS	ISSUED BY: DANA	DATE: 6/2/2016	CONTRACT NO.:
DRAWN BY: DANA	MARK: PIRELLO	FILE NAME: 698705C-304.dgn	CONTRACT NO.:
U.S. ARMY CORPS OF ENGINEERS NEW YORK http://www.nan.usace.army.mil	MARK: PIRELLO	FILE NUMBER: 10017	CONTRACT NO.:
MODFATT & NICHOL 529 9th Avenue, 14th Floor New York, New York 10017 212-768-7454	MARK: PIRELLO	FILE NUMBER: 10017	CONTRACT NO.:

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SITE PROFILE (4 OF 6)

SHEET
IDENTIFICATION
C-304
SHEET OF

LAST SAVED BY: JIMACPERSON, 1/31/2011 1:30:33 PM

PATH: Q:\TA\16987-05\cadd\Active_Preliminary\

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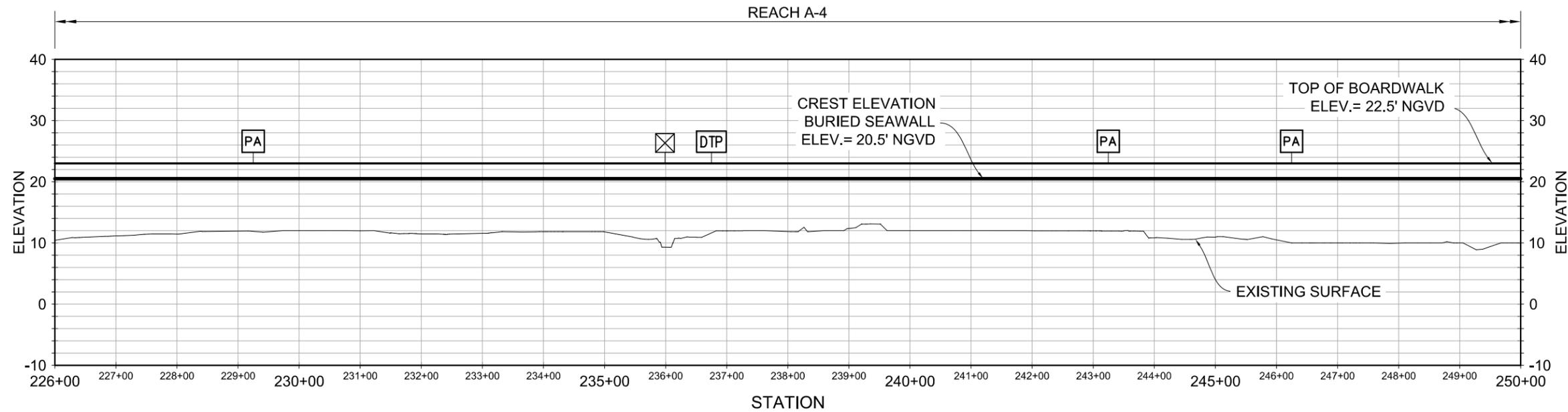
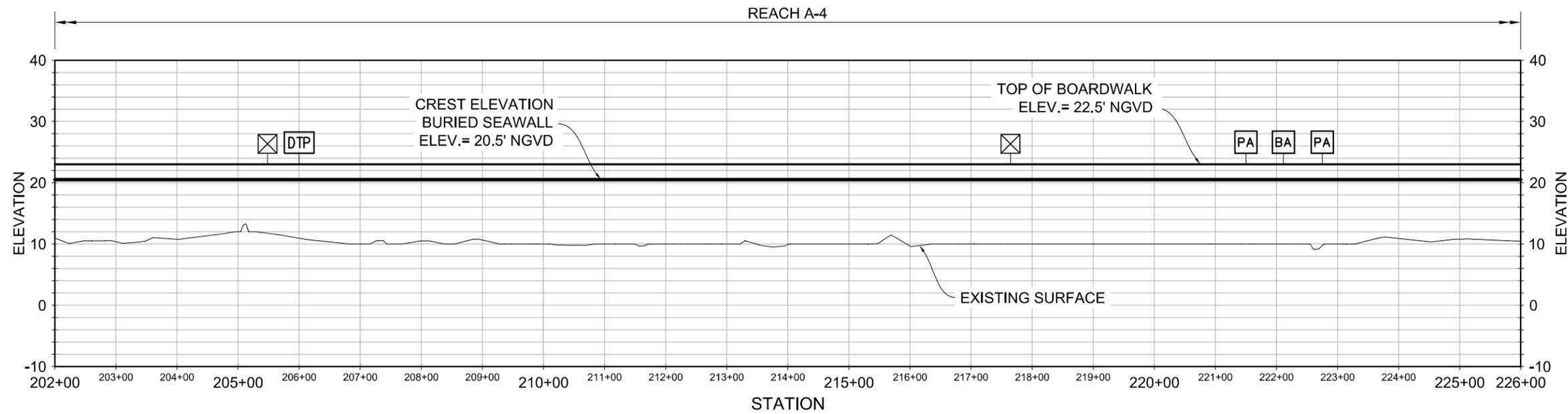
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arsmith

LAST PLOTTED BY:

SEE SHEET C-304 FOR CONTINUATION



NOTE

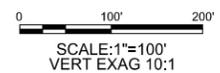
1. TYPICAL SECTIONS SHOWN ON C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
3. PROFILES FOR 15.6 FT SWL CALCULATED ALONG BASELINE. REFER TO SITE PLANS FOR BASELINE LOCATION.

SEE SHEET C-306 FOR CONTINUATION

LEGEND

- PA PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509
- DTP COMBINED TRUCK & PEDESTRIAN
ACCESS RAMP, SEE SHEET C-510
- MVA MAINTENANCE VEHICLE ACCESS
RAMP, SEE SHEET C-510
- BA BOARDWALK ACCESS
SEE SHEET C-508
- X DRAINAGE CONTROL STRUCTURE,
SEE SHEET C-512
- [Grid] SANITARY/DRAINAGE CONTROL
STRUCTURE SEE SHEET C-514
- TG TIDE GATE
SEE SHEET C-513

FINAL JUNE 2016
NOT FOR CONSTRUCTION



US Army Corps
of Engineers®

MARK	DATE	DESCRIPTION
2	3/2/2016	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS
1	1/9/2015	REVISIONS FOR AIR COMMENTS

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS	DATE: 06/01/16
DRAWN BY: D.M.A.	SOLICITATION NO.:
MARK: PIRELLO	CONTRACT NO.:
FILE NAME: 698705C-305.dgn	FILE NUMBER:
PILOT DATE: 6/2/2016	MARK:

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

SITE PROFILE (5 OF 6)

SHEET
IDENTIFICATION
C-305
SHEET OF

LAST SAVED BY: JIMACPERSON, 1/31/2011 1:30:33 PM

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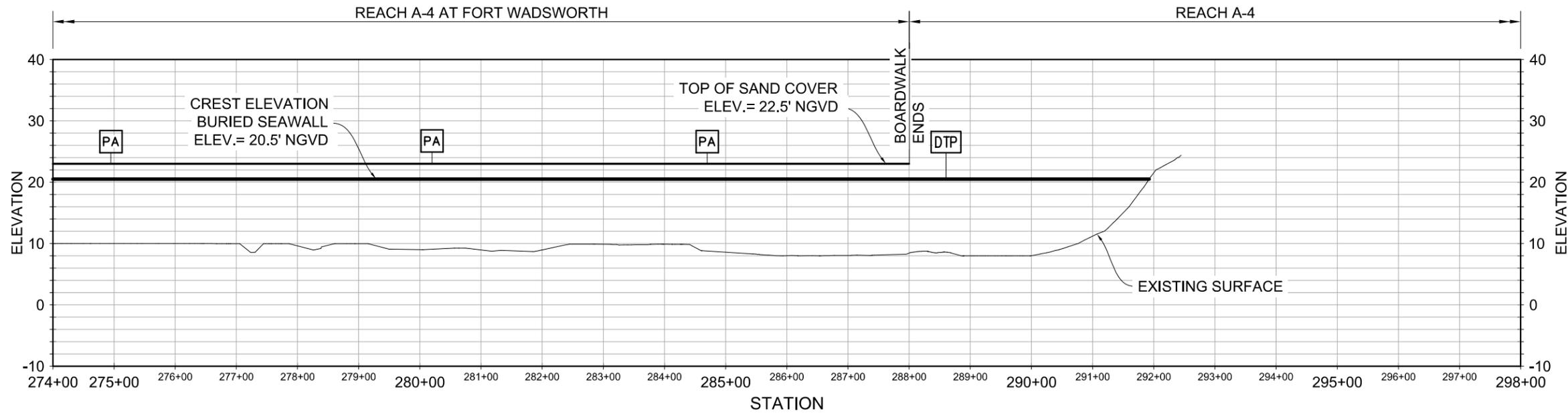
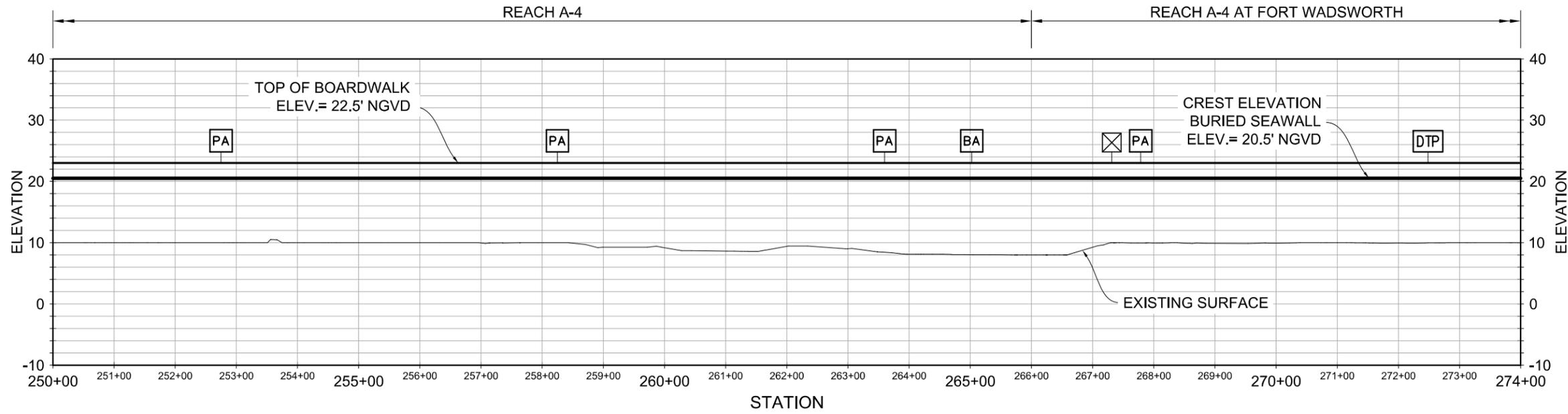
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SEE SHEET C-305 FOR CONTINUATION



NOTE

1. TYPICAL SECTIONS SHOWN ON C-501 TO C-507.
2. ALL ELEVATIONS REFERENCED TO NGVD 29.
3. PROFILES FOR 15.6 FT SWL CALCULATED ALONG BASELINE. REFER TO SITE PLANS FOR BASELINE LOCATION.

LEGEND

- PA PEDESTRIAN ACCESS STAIRS
SEE SHEET C-509
- DTP COMBINED TRUCK & PEDESTRIAN
ACCESS RAMP, SEE SHEET C-510
- MVA MAINTENANCE VEHICLE ACCESS
RAMP, SEE SHEET C-510
- BA BOARDWALK ACCESS
SEE SHEET C-508
- ☒ DRAINAGE CONTROL STRUCTURE,
SEE SHEET C-512
- ☒ SANITARY/DRAINAGE CONTROL
STRUCTURE SEE SHEET C-514
- TG TIDE GATE
SEE SHEET C-513

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MARK	REVISIONS FOR OUR COMMENTS	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR OUR COMMENTS	1/9/2015	MAP

DESIGNED BY: M. J. ...	CHECKED BY: D. ...	DATE: 06/01/16
DRAWN BY: M. J. ...	MARKED BY: M. J. ...	SUBMITTED BY: M. J. ...
PROJECT NO.: XXXX	CONTRACT NO.: XXXX	FILE NUMBER: XXXX
U.S. ARMY CORPS OF ENGINEERS U.S. ARMY ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil MOFFATT & NICHOL 529 9th Avenue, 14th Floor New York, New York 10017 212-768-7454		

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND
SITE PROFILE (6 OF 6)

SHEET
IDENTIFICATION
C-306
SHEET OF

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PATH: Q:\TA\6987-05\cadd\Active_Preliminary\

FILE: 698705C-501.dgn

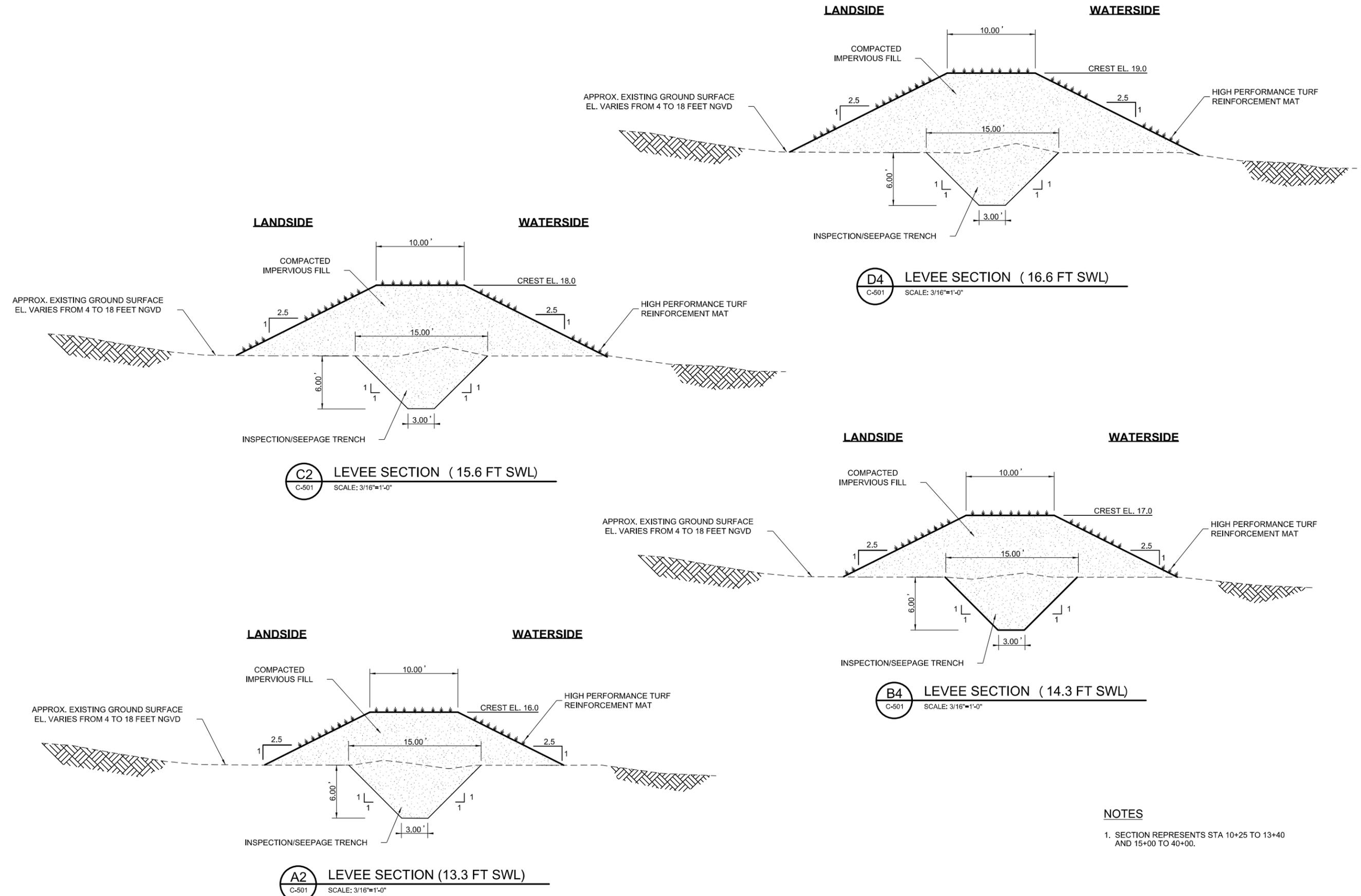
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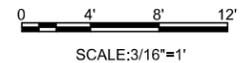
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NOTES

- 1. SECTION REPRESENTS STA 10+25 TO 13+40 AND 15+00 TO 40+00.



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2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP
			APPR.

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS NEW YORK	DATE: 6/2/2016	ISSUED BY: CSG	CONTRACT NO.:
FORN BY: CSG	MAP	MAP	FILE NUMBER:
SUBMITTED BY: http://www.nan.usace.army.mil	PILOT DATE: 6/2/2016	FILE NAME: 698705C-501.dgn	ANSI D
MOFFATT & NICHOL 529 9th Avenue, 14th Floor New York, New York 10017 212-768-7454			

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

TYPICAL SECTIONS REACH A-1

SHEET IDENTIFICATION
C-501
SHEET OF

PATH: Q:\TA\6987-05\cadd\Active_Preliminary\

FILE: 698705C-502.dgn

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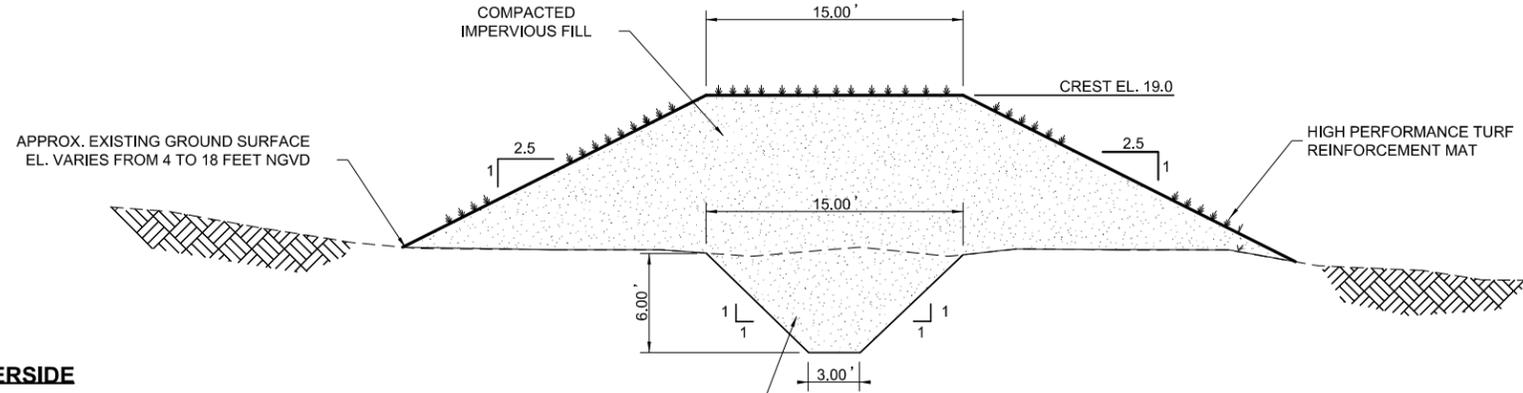
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LANDSIDE

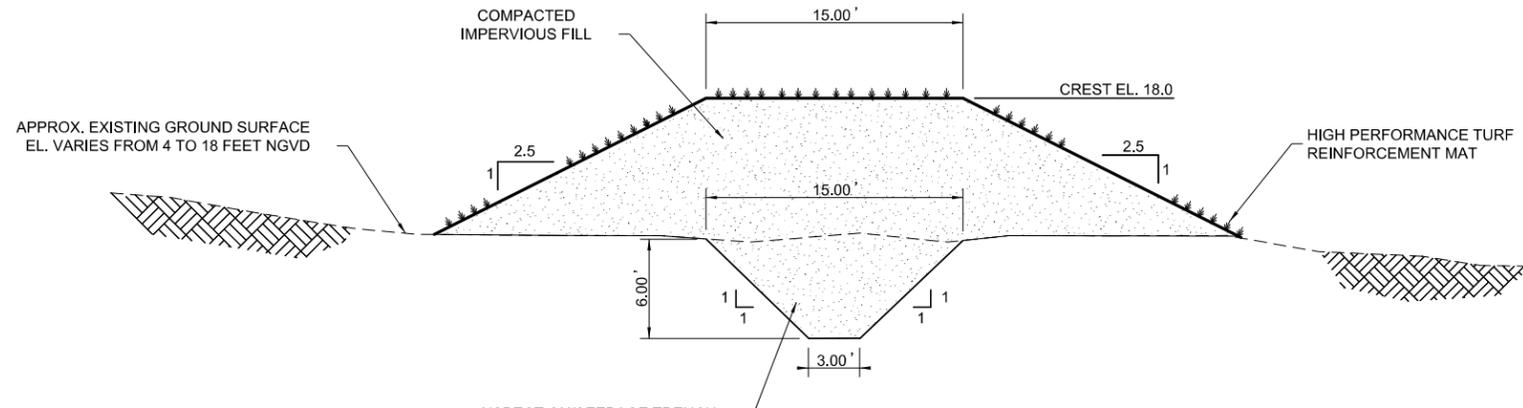
WATERSIDE



D4 LEVEE SECTION (16.6 FT SWL)
C-502 SCALE: 3/16"=1'-0"

LANDSIDE

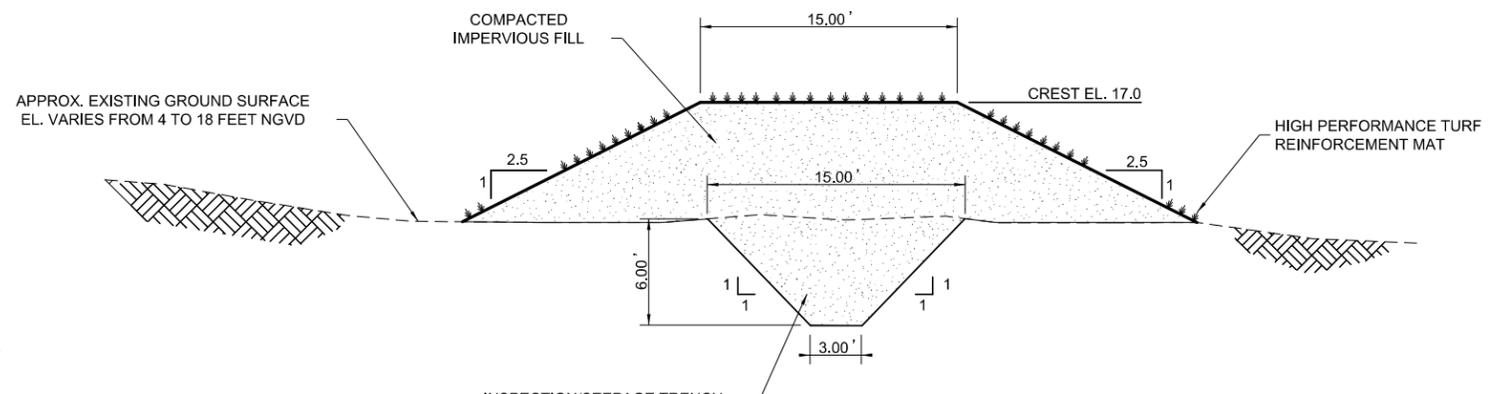
WATERSIDE



C2 LEVEE SECTION (15.6 FT SWL)
C-502 SCALE: 3/16"=1'-0"

LANDSIDE

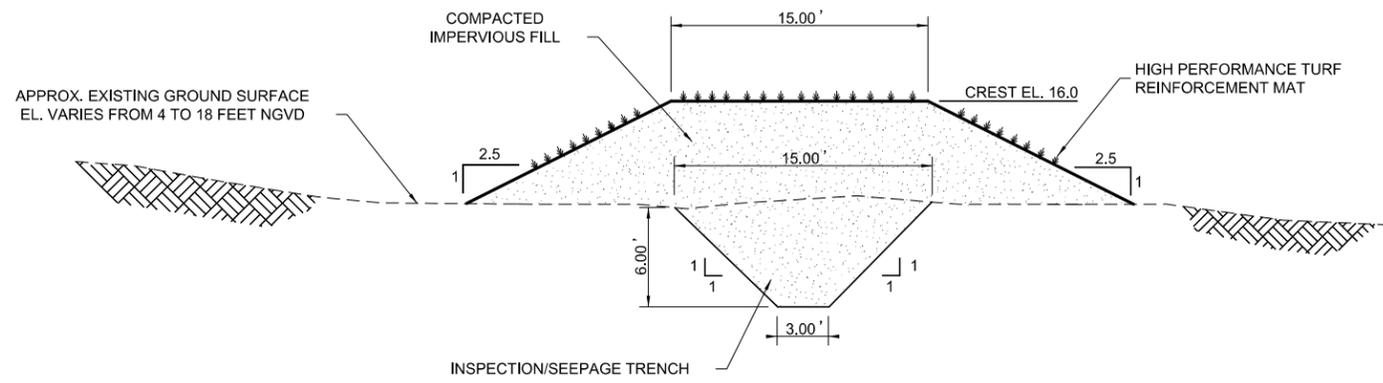
WATERSIDE



B4 LEVEE SECTION (14.3 FT SWL)
C-502 SCALE: 3/16"=1'-0"

LANDSIDE

WATERSIDE

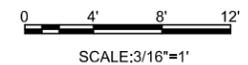


A2 LEVEE SECTION (13.3 FT SWL)
C-502 SCALE: 3/16"=1'-0"

NOTES

- 1. SECTION REPRESENTS STA 41+00 TO STA 47+14.81.

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1	1/9/2015	REVISIONS FOR AIR COMMENTS	MAP
			APPR.

DESIGNED BY:	DATE:	DATE:
U.S. ARMY CORPS OF ENGINEERS	6/2/2016	6/2/2016
U.S. ARMY ENGINEER DISTRICT	CSG	CSG
NEW YORK	MAP	MAP
http://www.nan.usace.army.mil	SUBMITTED BY:	CONTRACT NO.:
	MOFFATT & NICHOL	
	529 9th Avenue, 14th Floor	FILE NUMBER:
	New York, New York 10017	698705C-502
	212-768-7454	ANSI D

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND
TYPICAL SECTIONS REACH A-2

SHEET
IDENTIFICATION
C-502
SHEET OF

PATH: Q:\TA\6987-05\cadd\Active_Preliminary\

FILE: 698705C-503.dgn

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NOTES

1. SECTION REPRESENTS STA 47+14.81 TO STA 65+40.



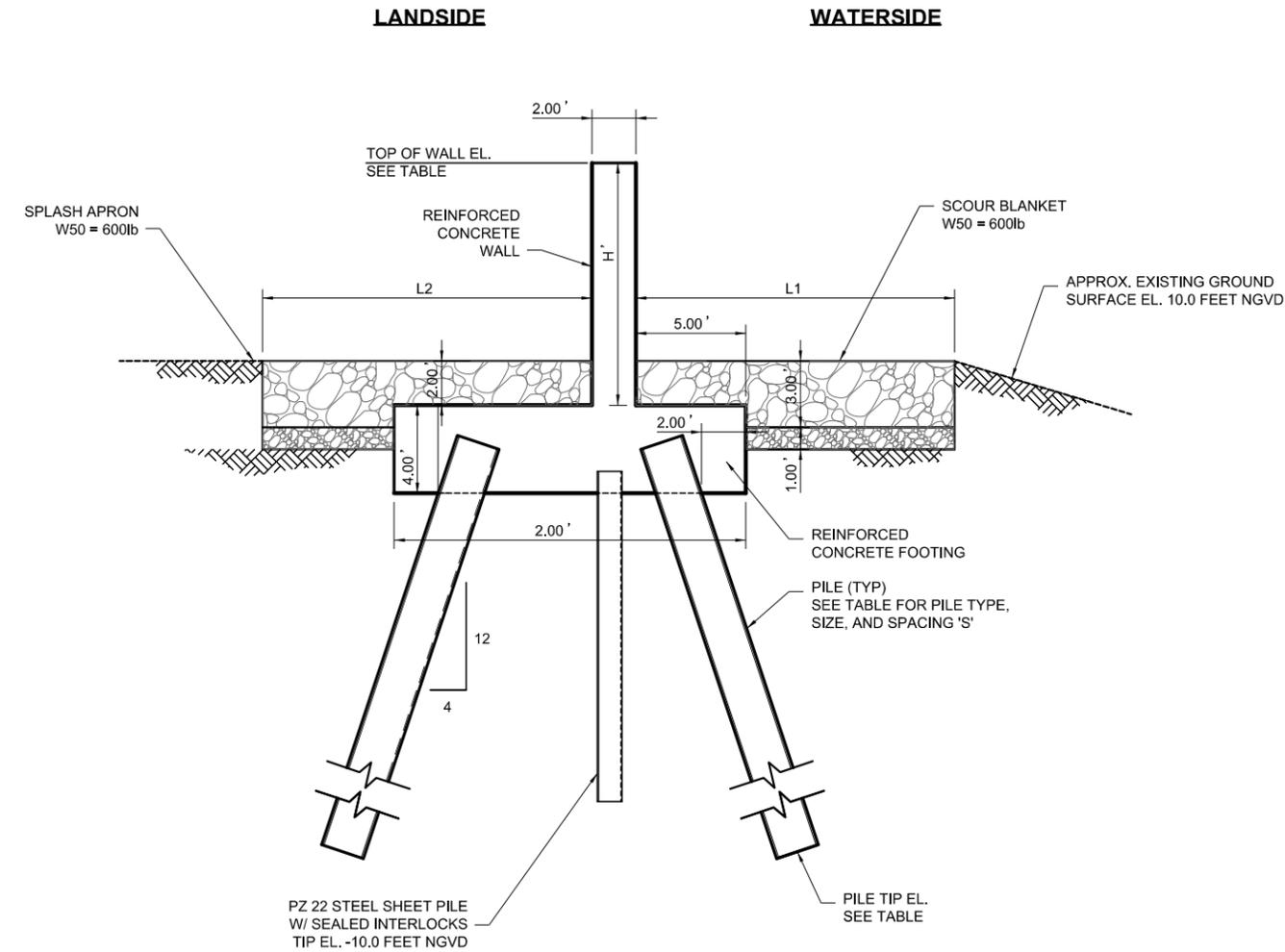
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NO.	REVISIONS FOR AIR COMMENTS	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP
			MARK

DESIGNED BY: MAP	ISSUED BY: CSG	DATE: 06/01/16	CONTRACT NO.:
DRAWN BY: CSG	MAP	PILOT DATE: 6/2/2016	FILE NUMBER:
SUBMITTED BY:	FILE NAME: 698705C-503.dgn	SIZE: 1.2	ANSI D
U.S. ARMY CORPS OF ENGINEERS U.S. ARMY ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil		MOFFATT & NICHOL 529 5th Avenue, 14th Floor New York, New York 10017 212-768-7454	

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND
TYPICAL SECTIONS REACH A-3

SHEET IDENTIFICATION
C-503
SHEET OF



B2 FLOOD WALL SECTION
SCALE: 1/4"=1'-0"

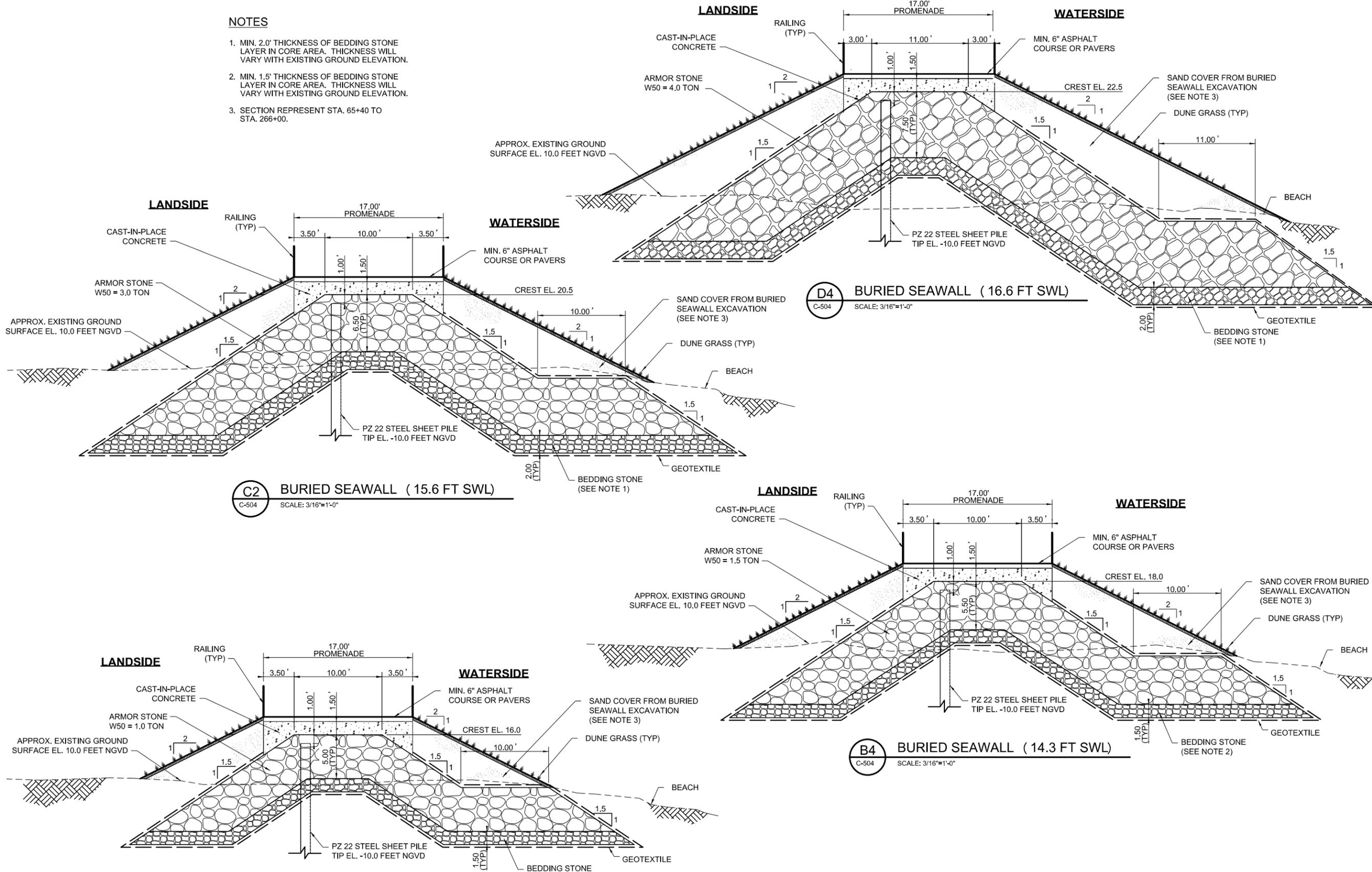
SWL (FT)	ELEVATIONS (FT, NGVD)		PILE DATA		DIMENSIONS					
	TOP OF WALL	PILE TIP	TYPE	SIZE	H (FT)	B (FT)	T (FT)	L1 (FT)	L2 (FT)	S (FT)
13.3	16.0	-75.0	H-PILE	HP14 X 89	8.0	12.0	1.5	15.0	10.0	12.0
14.3	18.0	-75.0	H-PILE	HP14 X 89	10.0	15.0	1.5	15.0	12.0	11.0
15.6	20.5	-90.0	H-PILE	HP14 X 89	12.5	16.0	2.0	15.0	15.0	12.0
16.6	22.5	-90.0	H-PILE	HP14 X 90	14.5	18.0	2.5	15.0	16.0	10.0

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0 3' 6' 9'
SCALE: 1/4"=1'

NOTES

1. MIN. 2.0' THICKNESS OF BEDDING STONE LAYER IN CORE AREA. THICKNESS WILL VARY WITH EXISTING GROUND ELEVATION.
2. MIN. 1.5' THICKNESS OF BEDDING STONE LAYER IN CORE AREA. THICKNESS WILL VARY WITH EXISTING GROUND ELEVATION.
3. SECTION REPRESENT STA. 65+40 TO STA. 266+00.



A2 BURIED SEAWALL (13.3 FT SWL)
C-504 SCALE: 3/16"=1'-0"

C2 BURIED SEAWALL (15.6 FT SWL)
C-504 SCALE: 3/16"=1'-0"

B4 BURIED SEAWALL (14.3 FT SWL)
C-504 SCALE: 3/16"=1'-0"

D4 BURIED SEAWALL (16.6 FT SWL)
C-504 SCALE: 3/16"=1'-0"

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0 4 8 12'
SCALE: 3/16"=1'



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NO.	DATE	DESCRIPTION
2	3/21/2016	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS
1	1/9/2015	REVISIONS FOR AIR COMMENTS
		MAP
		DATE
		APPR.

DESIGNED BY:	DATE:	DESIGN NO.:
U.S. ARMY CORPS OF ENGINEERS	06/01/17	160705C-504
U.S. ARMY ENGINEER DISTRICT	DESIGNED BY:	CONTRACT NO.:
NEW YORK	C/SJ	
http://www.nan.usace.army.mil	MAP	FILE NUMBER:
		160705C-504
MOFFATT & NICHOL	PLOT SCALE:	PLOT DATE:
529 9th Avenue, 14th Floor	1:2	6/2/2016
New York, New York 10017	SIZE:	FILE NAME:
212-768-7454	ANSI D	160705C-504.dgn

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND
TYPICAL SECTIONS REACH A-4

SHEET IDENTIFICATION
C-504
SHEET OF

PATH: Q:\TA\16987-05\cadd\Active_Preliminary\

FILE: 698705C-504.dgn

6/2/2016

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arsmith

LAST PLOTTED BY:

PATH: Q:\TA\6987-05\cadd\Active_Preliminary\

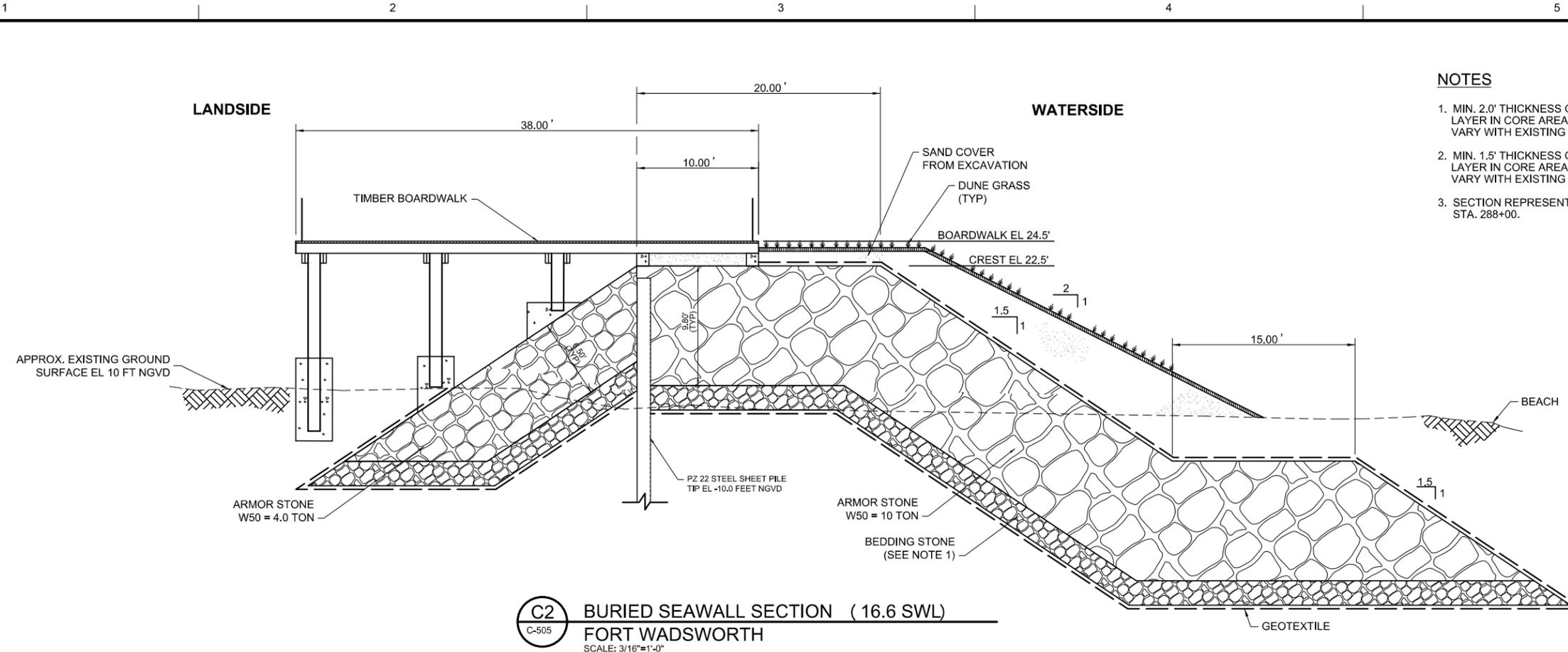
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6/2/2016

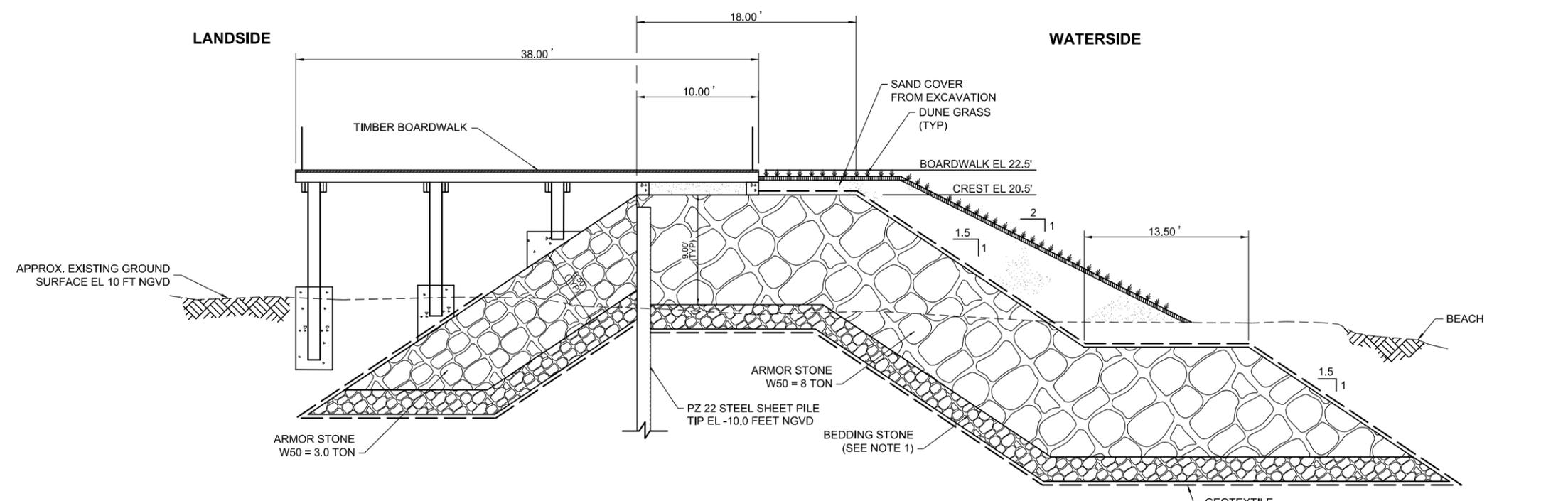
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arSmith

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C2 BURIED SEAWALL SECTION (16.6 SWL)
 FORT WADSWORTH
 SCALE: 3/16"=1'-0"



A2 BURIED SEAWALL SECTION (15.6 SWL)
 FORT WADSWORTH
 SCALE: 3/16"=1'-0"

NOTES

1. MIN. 2.0' THICKNESS OF BEDDING STONE LAYER IN CORE AREA. THICKNESS WILL VARY WITH EXISTING GROUND ELEVATION.
2. MIN. 1.5' THICKNESS OF BEDDING STONE LAYER IN CORE AREA. THICKNESS WILL VARY WITH EXISTING GROUND ELEVATION.
3. SECTION REPRESENT STA. 266+00 TO STA. 288+00.

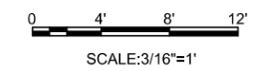


NO.	DATE	DESCRIPTION	MARK
2	3/2/2016	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	MAP
1	1/9/2015	REVISIONS FOR AIR COMMENTS	MAP
			APPR.

DESIGNED BY: M. J. JONES	DATE: 10/2011
DRAWN BY: C.S.G.	SOLICITATION NO.:
SUBMITTED BY: M.A.P.	CONTRACT NO.:
U.S. ARMY CORPS OF ENGINEERS NEW YORK http://www.nan.usace.army.mil	FILE NUMBER:
MOFFATT & NICHOL 529 9th Avenue, 14th Floor New York, New York 10017 212-768-7454	PILOT DATE: 6/2/2016
	SCALE: 1:2
	FILE NAME: 698705C-505.dgn
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COASTAL STORM RISK MANAGEMENT
 FEASIBILITY STUDY FOR THE
 SOUTH SHORE OF STATEN ISLAND
 TYPICAL SECTIONS REACH A-4 AT
 FORT WADSWORTH
 (1 OF 2)

FINAL JUNE 2016
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SHEET IDENTIFICATION
C-505
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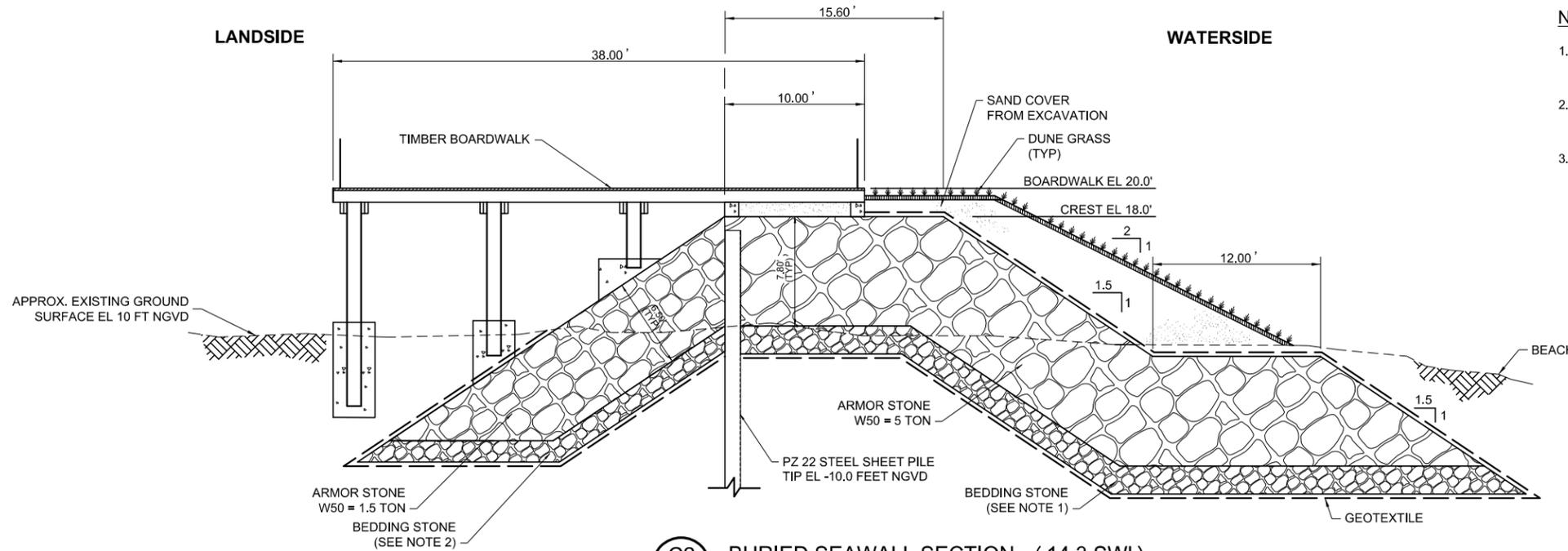
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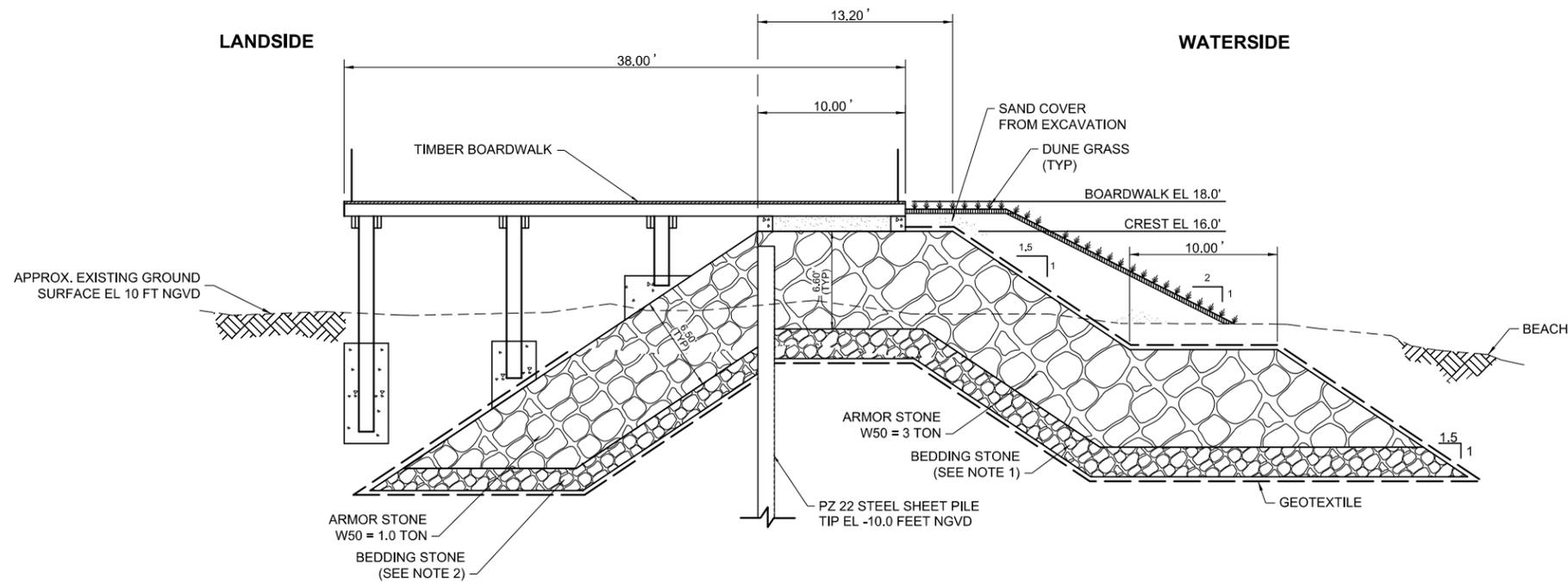
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C2 BURIED SEAWALL SECTION (14.3 SWL)
 FORT WADSWORTH
 SCALE: 3/16"=1'-0"



A2 BURIED SEAWALL SECTION (13.3 SWL)
 FORT WADSWORTH
 SCALE: 3/16"=1'-0"

- NOTES**
1. MIN. 2.0' THICKNESS OF BEDDING STONE LAYER IN CORE AREA. THICKNESS WILL VARY WITH EXISTING GROUND ELEVATION.
 2. MIN. 1.5' THICKNESS OF BEDDING STONE LAYER IN CORE AREA. THICKNESS WILL VARY WITH EXISTING GROUND ELEVATION.
 3. SECTION REPRESENT STA. 266+00 TO STA. 288+00.

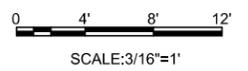


NO.	REVISIONS FOR OUR COMMENTS	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP
			APPR.

DESIGNED BY: M. J. ...	DATE: 10/2011
DRAWN BY: C.S.G.	SOLICITATION NO.:
SUBMITTED BY:	CONTRACT NO.:
PLOT SCALE: 1:2	FILE NUMBER:
SIZE: ANSI D	FILE NAME: 698705C-506.dgn

COASTAL STORM RISK MANAGEMENT
 FEASIBILITY STUDY FOR THE
 SOUTH SHORE OF STATEN ISLAND
 TYPICAL SECTIONS BEACH A-4 AT
 FORT WADSWORTH
 (2 OF 2)

FINAL JUNE 2016
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SHEET IDENTIFICATION
C-506
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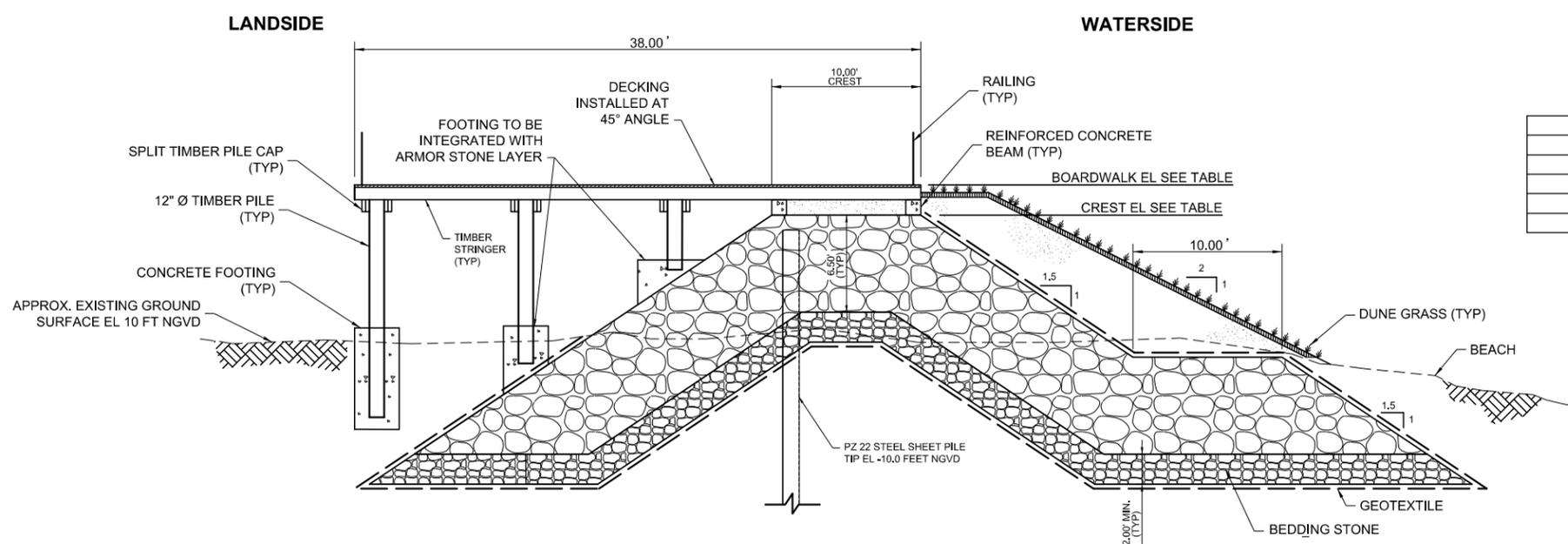
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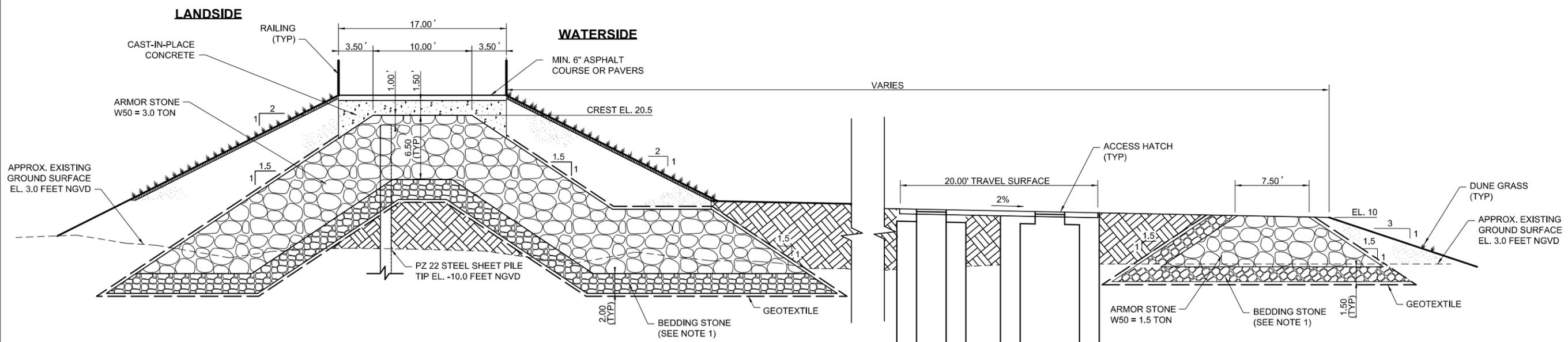
5



ELEVATIONS (FT, NGVD)		
SWL	CREST ELEVATION	TOP OF BOARDWALK
13.3	16.0	18.0
14.3	18.0	20.0
15.6	20.5	22.5
16.6	22.5	24.5

NOTE
1. SECTION REPRESENTS TYPICAL BOARDWALK SECTION FROM STA. 158+00 TO STA. 266+00.

B2 TYPICAL SECTION - BOARDWALK
C-507 SCALE: 3/16"=1'-0"



A2 TYPICAL SECTION - ROADWAY
C-507 SCALE: 3/16"=1'-0"

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0 4' 8' 12'
SCALE: 3/16"=1'



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NO.	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/21/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP
			MARK

DESIGNED BY:	DATE:	CONTRACT NO.:
U.S. ARMY CORPS OF ENGINEERS	10/2011	
U.S. ARMY ENGINEER DISTRICT	DESIGNED BY:	CONTRACT NO.:
NEW YORK	CSG	
http://www.nan.usace.army.mil	MAP	
MOFFATT & NICHOL	FILE NUMBER:	
529 9th Avenue, 14th Floor	6/2/2016	
New York, New York 10017	1:2	
212-768-7454	ANSI D	

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND
TYPICAL SECTION
BOARDWALK AND ROADWAY

SHEET IDENTIFICATION
C-507
SHEET OF

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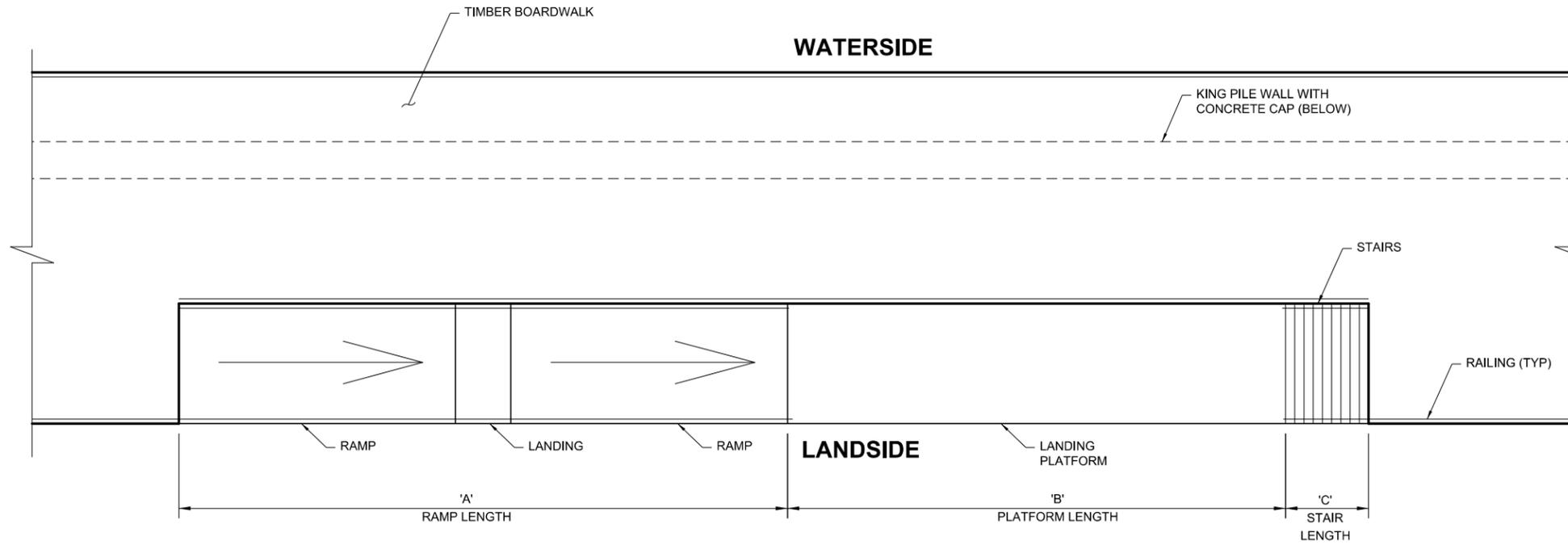
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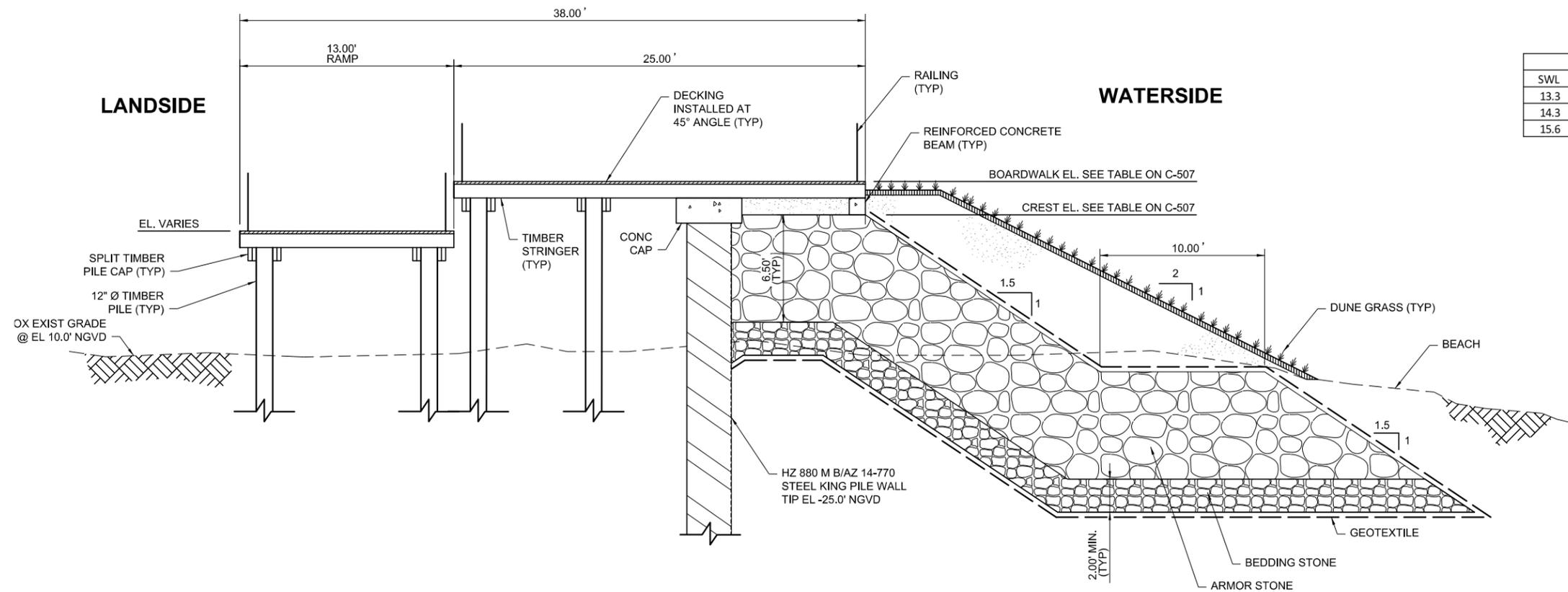
arsmith

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C1 TYPICAL PLAN - BOARDWALK ACCESS
C-508 SCALE: NTS

APPROX. BEGIN STATION	TOTAL LENGTH (FT)	PLATFORM ELEVATION (FT)	DIMENSIONS		
			RAMP 'A' (FT)	PLATFORM 'B' (FT)	STAIR 'C' (FT)
162+50'	265	ON GRADE	160	89	16.0
189+00'	495	ON GRADE	155	325	15.0
221+00'	230	17.0	66	156	8.0
262+50'	467	17.0	66	393	8.0



A1 TYPICAL SECTION - BOARDWALK ACCESS
C-508 SCALE: 1/4"=1'-0"

ELEVATIONS (FT, NGVD)		
SWL	CREST ELEVATION	TOP OF BOARDWALK
13.3	16.0	18.0
14.3	18.0	20.0
15.6	20.5	22.5



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2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP
			MARK

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CHECKED BY: [blank]	FILE NAME: 698705C-508.dgn
APPROVED BY: [blank]	ANSI D: [blank]
DESIGNED BY: [blank]	CONTRACT NO.: [blank]
DRAWN BY: [blank]	FILE NUMBER: [blank]
CHECKED BY: [blank]	PLOT DATE: 6/2/2016
APPROVED BY: [blank]	SCALE: 1/4"=1'-0"
DESIGNED BY: [blank]	ANSI D: [blank]

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND
TYPICAL SECTION BOARDWALK ACCESS

SHEET IDENTIFICATION
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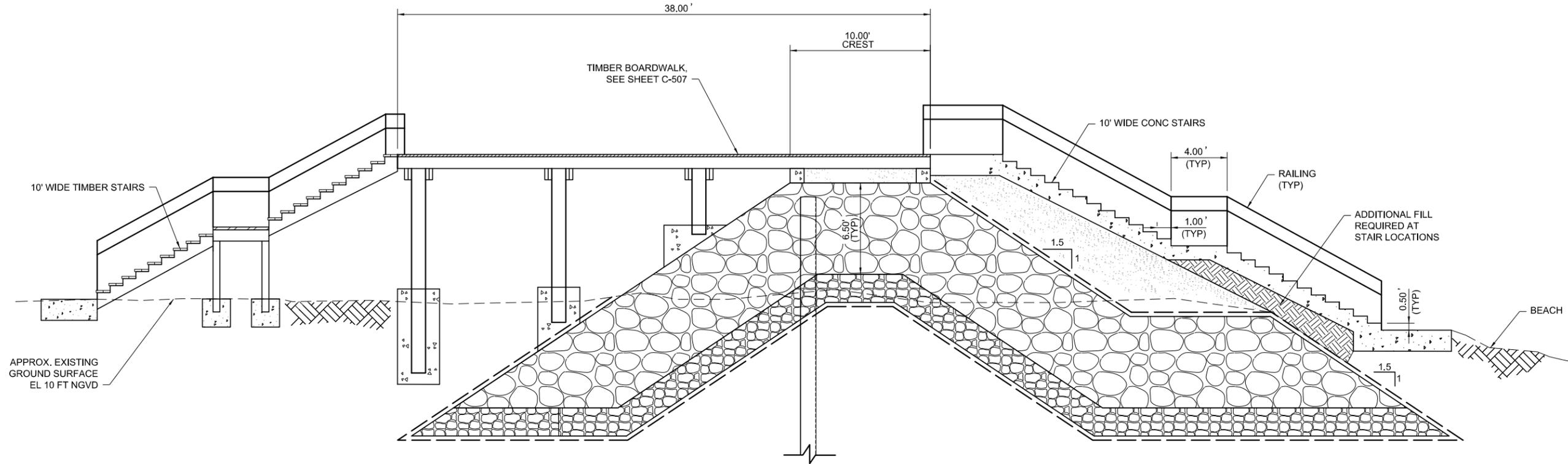
3

4

5

LANDSIDE

WATERSIDE



B2 TYPICAL SECTION - PEDESTRIAN ACCESS STAIRS
 C-509 SCALE: 1/4"=1'-0"

NOTES

1. STAIR LAYOUT SHOWN FOR THE 15.6 FT SWL. NUMBER OF STAIRS WILL VARY BASED ON SWL. SEE SHEETS C-504 THROUGH C-506 FOR BURIED SEAWALL DIMENSIONS.



SCALE: 1/4"=1'

FINAL JUNE 2016
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2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP
			APPR.

DESIGNED BY: MAP	DATE: 06/02/16
DRAWN BY: CSG	SUBMITTED BY: MAP
ISSUED BY: CSG	FILE NAME: 698705C-506.dgn
PROJECT NO.:	CONTRACT NO.:
FILE NUMBER:	

U.S. ARMY CORPS OF ENGINEERS
 U.S. ARMY ENGINEER DISTRICT
 NEW YORK
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 New York, New York 10017
 212-768-7454

COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND

TYPICAL SECTION
PEDESTRIAN ACCESS STAIRS

SHEET IDENTIFICATION
C-509

PATH: Q:\TA\6987-05\cadd\Active_Preliminary\

FILE: 698705C-510.dgn

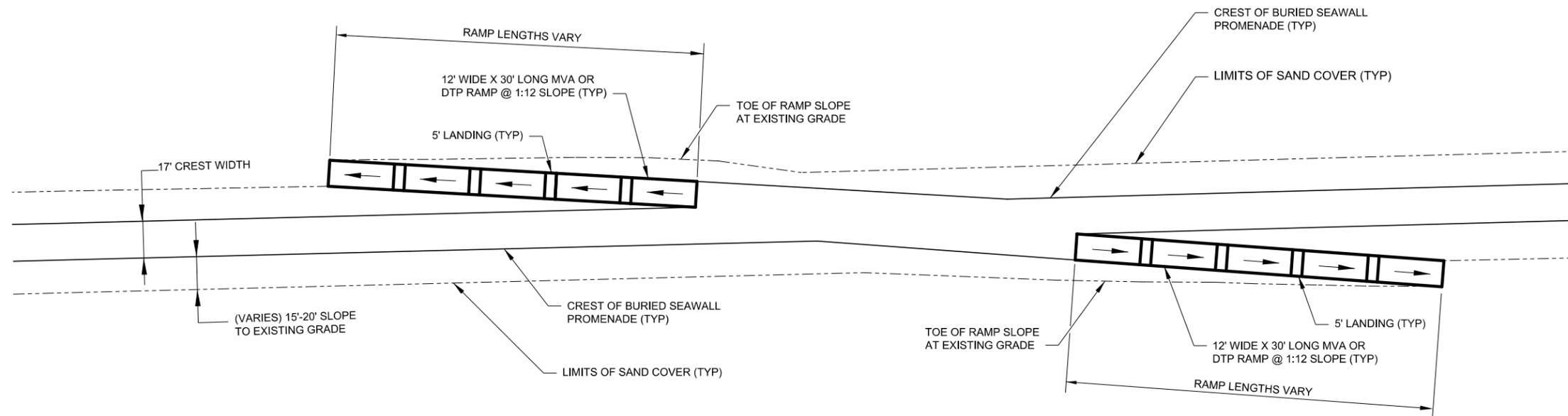
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LAST PLOTTED BY:

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C1 PLAN - TYPICAL MVA AND DTP RAMP DETAIL
C-510 NOT TO SCALE

LEGEND

MVA = MOTOR VEHICLE ACCESS RAMP
 DTP = COMBINED TRUCK & PEDESTRIAN ACCESS RAMP

NOTE:

1. RAMP SHOWN IS A TYPICAL CONDITION.
 RAMP GEOMETRY MAY VARY BY LOCATION.



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MARK	DESCRIPTION	DATE	APPR.
2	INCORPORATES SPONSOR AND STAKEHOLDER COMMENTS	3/2/2016	MAP
1	REVISIONS FOR AIR COMMENTS	1/9/2015	MAP

DESIGNED BY: MAP	DATE: 06/01/16	SUBMITTED BY: MAP	CONTRACT NO.:
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COASTAL STORM RISK MANAGEMENT
 FEASIBILITY STUDY FOR THE
 SOUTH SHORE OF STATEN ISLAND
 TYPICAL MVA AND DTP RAMP DETAIL

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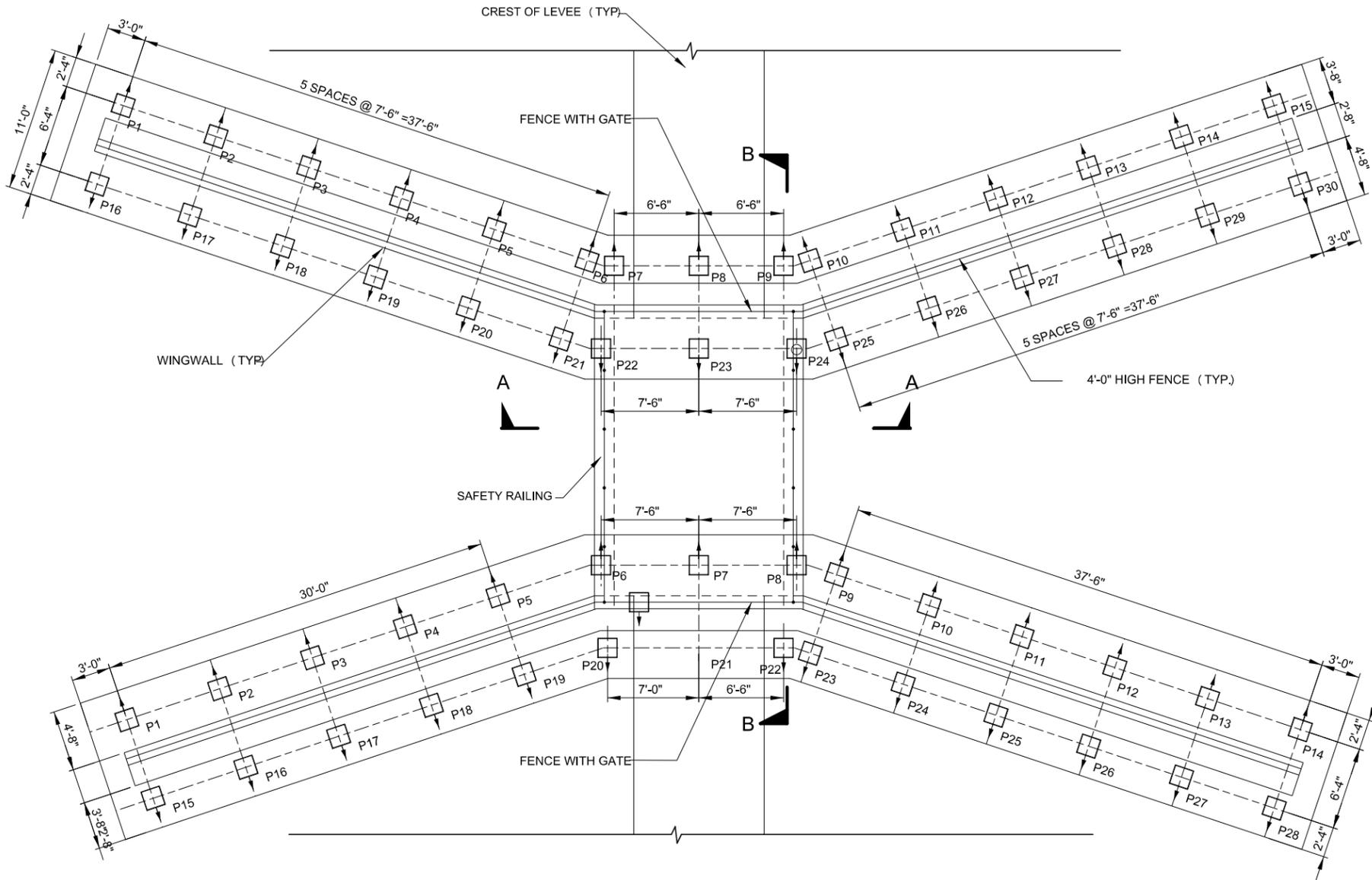
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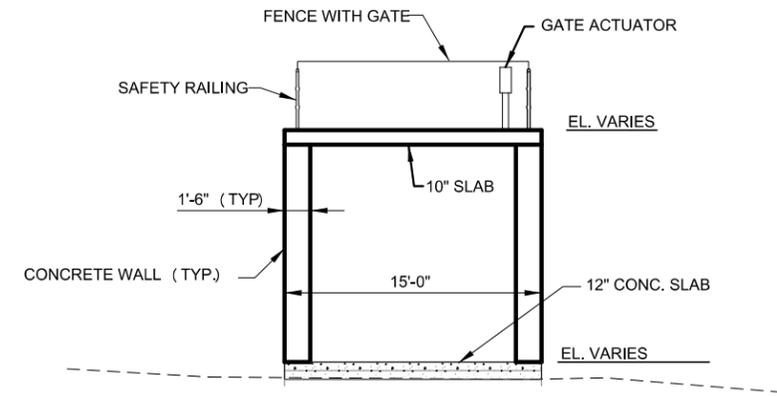
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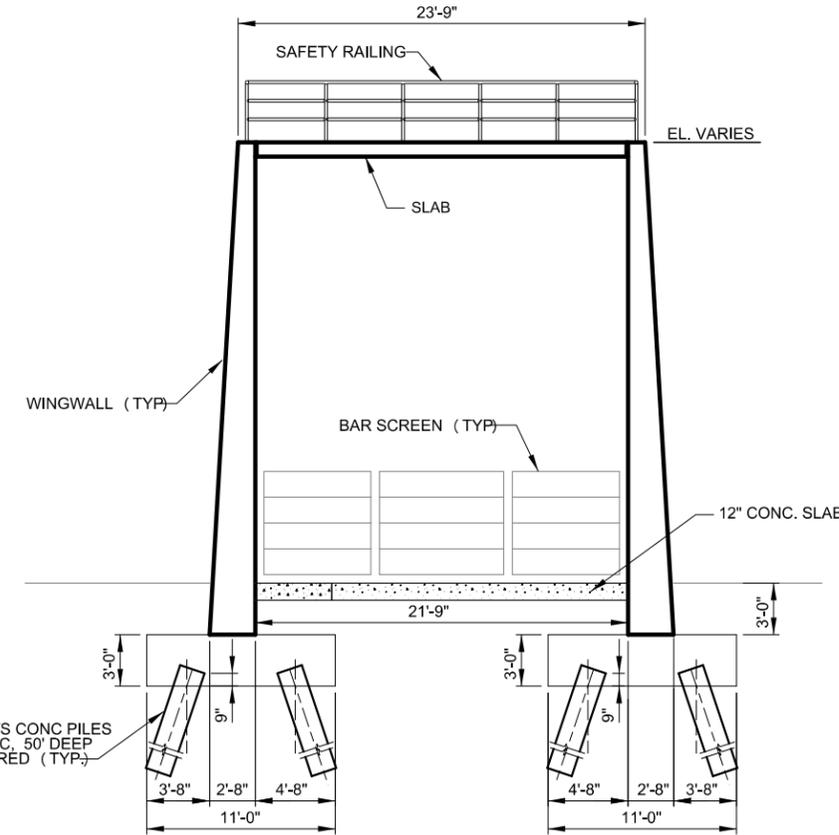
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B LONGITUDINAL SECTION
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@ 7'-6" OC, 50' DEEP
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New York, New York 10017		
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COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND
TIDE GATE STRUCTURE DETAILS

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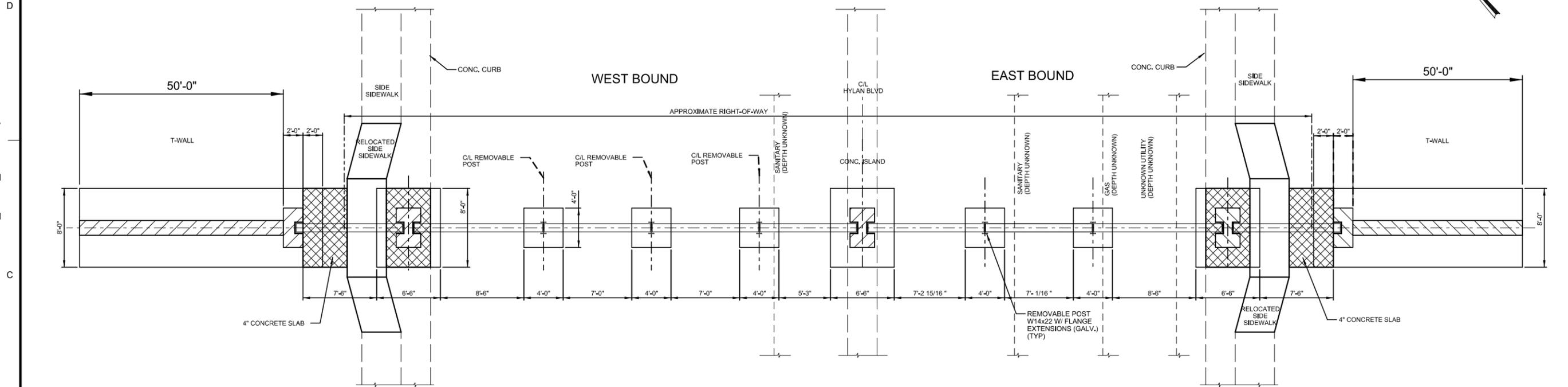
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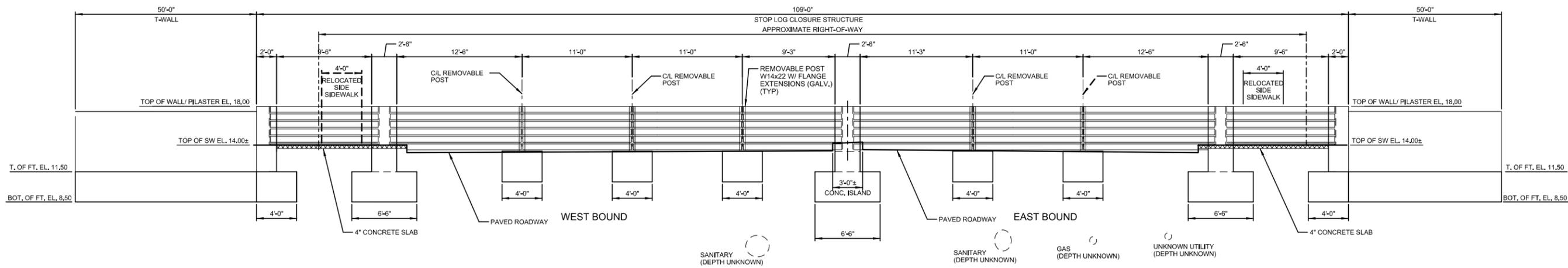
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B PLAN VIEW
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A ELEVATION - FLOODWALL/BULKHEAD CLOSURE STRUCTURE - (ELEVATIONS ALONG C/L WALL)
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COASTAL STORM RISK MANAGEMENT
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 CLOSURE STRUCTURE
 PLAN AND ELEVATION

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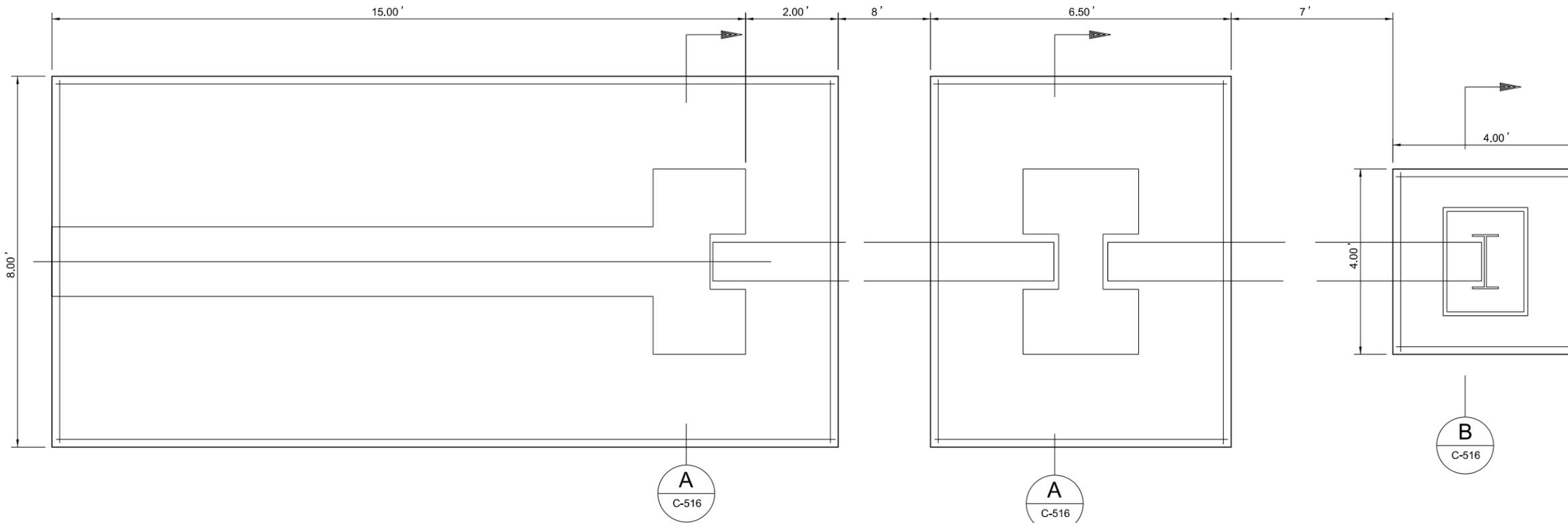
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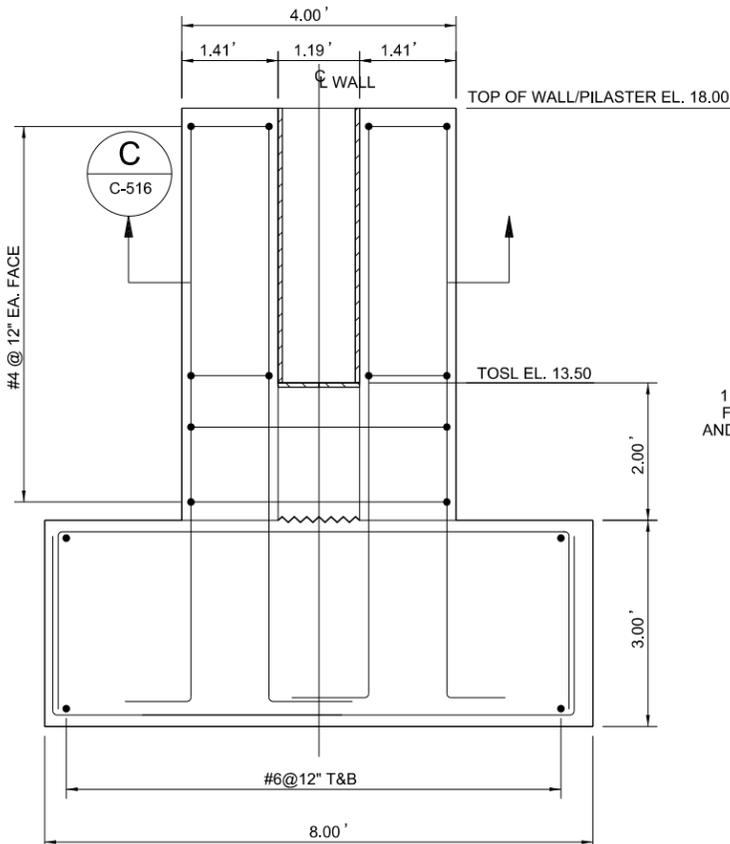
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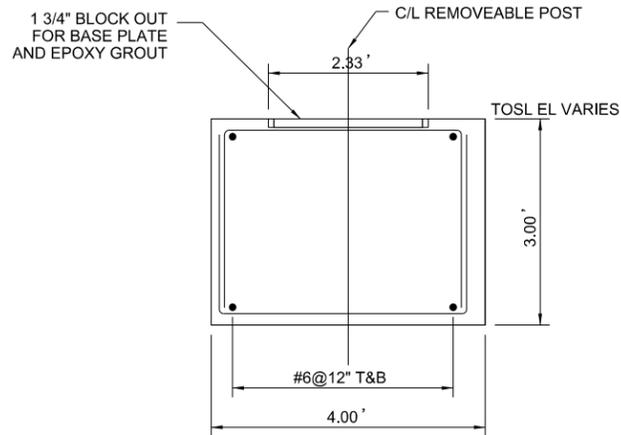
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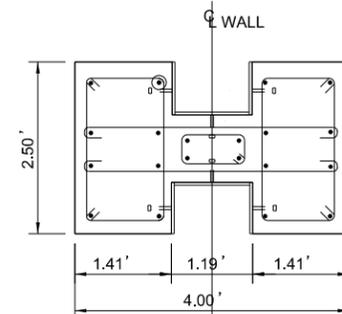
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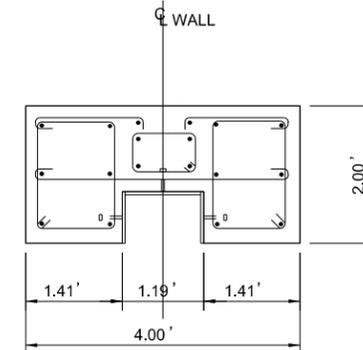
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B SECTION
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PLAN VIEW



PLAN VIEW

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COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY FOR THE
SOUTH SHORE OF STATEN ISLAND
CLOSURE STRUCTURE DETAILS

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Appendix B

Section 404(b)(1) Water Quality Evaluation

**SECTION 404(b)(1) GUIDELINES EVALUATION,
SOUTH SHORE OF STATEN ISLAND COASTAL STORM RISK
MANAGEMENT PROJECT, NEW YORK CITY, NEW YORK**

INTRODUCTION

This document presents a Section 404(b)(1) guidelines evaluation for the South Shore of Staten Island Coastal Storm Risk Management Project (hereafter referred to as “Project”). The primary goal of the Project is to reduce the risk of damages from hurricane and storm surge flooding along the south shore of Staten Island. The evaluation is based on the regulations found in 40 CFR 230, Section 404(b)(1): Guidelines for Specification of Disposal Sites for Dredged or Fill Material. The regulations implement sections 404(b) and 401(1) of the Clean Water Act, which govern disposal of dredged and fill material inside the territorial sea baseline [§230.2(b)].

DRAFT 404(b)(1) EVALUATION

The following Section 404(b)(1) evaluation is presented in a format consistent with typical evaluations in the New York City area and addresses all required elements of the evaluation.

I. Project Description

- a. Location - The project is located solely within the Borough of Staten Island, City of New York, and is made up of 5.5 miles of coastline from Fort Wadsworth to Oakwood Beach.
- b. General Description - The National Economic Development (NED) Plan involves the construction of a line of protection (LOP) consisting of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP would consist of a T-Type vertical floodwall, and levee. The crest elevation of the LOP would be 18 feet NGVD29 to 20.5 feet NGVD29. The finished elevation of the buried seawall, which accounts for approximately 80% of the LOP, would be 2 feet higher than this. The LOP would also include a closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and replacement of the existing boardwalk. The NED Plan also involves excavation of interior areas to augment/create 10 ponds that would alleviate flooding that may subsequently occur from interior runoff.
- c. Authority and Purpose - The project is authorized by a United States House of Representatives Committee on Public Works and Transportation resolution dated May 13, 1993. Public Law 113-2, The Disaster Relief Appropriations Act of 2013, will provide authorization for construction. This EIS was initiated by the United States Army Corps of Engineers (USACE), New York District (District). The New York State Department of Environmental Conservation (NYSDEC), New York City Department of Environmental Protection (NYCDEP), and New



York City Department of Parks and Recreation (NYCDPR) are the non-Federal sponsors of the Project.

d. General Description of Fill Material -

- (1) General Characteristics of Material - Foundation fill material, which would be the predominant material for the buried seawall, would generally consist of coarse to fine sands with varying amounts of clay, silt, and gravel. Compacted fill would be used for core and shell material for levee structures, and as earth cover material on the water side and impervious fill on the landside for the buried seawall. Considering that the compacted fill should be relatively impervious, it is anticipated that silty sand and/or clay sand layers of silt would be used. Fill material for the seawall cover would come from excavations of the seawall foundation. Fill material for the levee would be brought in from outside the Project area. .
- (2) Quantity of Material - The estimated fill quantity is 230,000 cubic yards.

e. Proposed Discharge Site -

- (3) Location - Project area as described above in I a.
- (4) Size - The LOP would have a crest elevation of +18.0 feet NGVD29 to +20.5 feet NGVD29, and the finished elevation of the buried seawall would be +22.5 feet NGVD29. The maximum width of the LOP would be approximately 85 feet, and the length would be 27,900 feet.
- (5) Type of Sites/Habitat – Fill placement would be in a beach/coastal plain habitat. Surface water classifications in the vicinity of the Project area are: SB in the Lower Bay, as designated by the NYSDEC. This classification permits primary and secondary contact recreation and fishing. In the interior lower watershed, surface water classification is generally I/C or C. Class C waters are designated as a best usage for fishing and Class I waters are designated as best usages for secondary contact recreation and fishing.
- (6) Time and Duration of Disposal - Construction of the LOP would be completed within an estimated 3.3-year period (nominally March 2019 – June 2022). Because osprey, northern harrier, Coopers hawk, and Preregrine falcon have the potential to nest, forage or flyover the lower watershed Project areas, a pre-construction survey would be conducted for these species. If these species are observed or nesting, measures would be taken to avoid impacting these species during construction and operation



of the NED Plan. The District would coordinate construction activities with the U.S. Fish and Wildlife Service, the National Marine Fisheries Services, and NYSDEC to ensure no adverse impacts to protected species. USACE has determined that construction of the tidal wetland at Oakwood Beach “may affect but is not likely to adversely affect” the Rufa Red Knot. In their Endangered Species Act Section 7 Coordination, the USFWS identified the Rufa Red Knot as feeding in the Great Kills vicinity, which is south of Oakwood Beach, which is the southern end of the Project area. The USFWS indicated a possibility that it might also feed in the Oakwood Beach area. To protect the Rufa Red Knot from disturbance, the USFWS recommended a seasonal window that would preclude construction in the Oakwood Beach area between May 1 and June 15 and also between July 15 and November 30, with the understanding that it can be modified if two years of surveys show no red knots are utilizing the Oakwood Beach area.

- f. Disposal Method - Hydraulic construction equipment, such as bulldozers and backhoes, depending upon the construction methods selected by the contractor(s). It is expected that all material associated with construction would be transported by truck and that all construction equipment would be land-based.

II. Factual Determinations

a. Physical Substrate Determination -

- (1) Substrate Elevation and Slope - No major impacts; the beach slope would be relatively unaffected by the LOP. Interior drainage areas would be excavated to approximately 2 feet NGVD29.
- (2) Sediment Type - No major impacts because sediment grain size of fill material would be similar to that of the existing environment.
- (3) Dredged Material Movement - No major impacts because no offshore dredging would occur and no offshore dredged material would be used as fill. Excavation material from ponds would likely be disposed of outside the Project area.
- (4) Physical Effects on Benthos - Some benthic invertebrates may be buried/smothered by LOP construction, and disturbed during excavation of ponds. However, long-term effects are not anticipated.
- (5) Other Effects - Not applicable (N/A).
- (6) Action to Minimize Impacts - N/A.

b. Water Circulation, Fluctuations, and Salinity Determinations -



- (1) Water - consider effects on:
- (a) Salinity - Proposed tidal gates associated with the LOP would remain open during normal tidal elevations to allow passage of saline tidewater into marsh areas and drainage of rainfall runoff. Consequently, no salinity effects are expected.
 - (b) Water Chemistry - The NED Plan is expected to result in improved water quality in the watershed compared to the No-Action (without-project) Alternative. Without the NED Plan, runoff would not be collected and directed to the proposed ponds. In contrast, proposed ponds function as wetlands that provide physical, chemical, and biological treatment of pollutants contained within runoff; flow rates into wetlands are attenuated, allowing sediment and organic debris to settle. During this process, nutrients undergo both chemical and biological transformation in a wetland. Nitrogen can be naturally altered into forms that are more favorable to uptake by wetland plants and phosphorus is readily precipitated out of water in many of its chemical forms, depending on the pH of the water and is also utilized by plants. Proposed ponds can also reduce fecal coliform concentrations by detaining water, allowing for die-off of microorganisms. (Note: ponds would be excavated to elevations appropriate for volunteer wetland plants, even though the District's NED Plan does not include planting).
 - (c) Clarity - Temporary increases in turbidity and suspended sediment during excavation of ponds and placement of fill for the LOP. Long-term impacts are not expected because fill material, dominated by coarse material (sand), would settle quickly out of the water column.
 - (d) Color - Minor short-term changes are possible in interior drainage areas due to turbid water.
 - (e) Odor - Not measurable.
 - (f) Taste - N/A.
 - (g) Dissolved Gas Levels – Not expected.
 - (h) Nutrients - Potential long-term increase due to proposed ponds functioning as wetlands.
 - (i) Eutrophication - N/A.



- (j) Other - N/A.
- (2) Current Pattern and Circulation -
 - (a) Current Pattern and Flow - The LOP would be constructed parallel to the shoreline and would reduce the drift and deposition of sand inland. A prevailing east to west littoral drift of sand is a known pattern on the south shore of Staten Island. However, the LOP is not expected to significantly alter or interrupt these littoral drift patterns.
 - (b) Velocity - No major impacts.
 - (c) Stratification - N/A.
- (3) Normal Water Level Fluctuations - N/A.
- (4) Salinity Gradients - No impact.
- (5) Actions that Will be Taken to Minimize Impacts - N/A.
- c. Suspended Particulate/Turbidity Determination -
 - (1) Expected Changes - Short-term increases are expected due to pond excavation.
 - (2) Effects on Chemical and Physical Properties of the Water Column -
 - (a) Light Penetration - Sediments dominated by coarse textured soil material that will settle rapidly out of the water column. Minor, temporary impacts are anticipated.
 - (b) Dissolved Oxygen - No adverse effects. Long-term effects expected to be positive from improved water quality.
 - (c) Toxic Metals and Organics - No adverse effects. Depending on the depth of excavation (which will not be finalized until after field work for plans and specifications), the NED Plan may potentially involve the disturbance of groundwater in areas where prior uses, regulatory database searches, and testing have indicated a potential for the presence of hazardous materials in the soil and/or groundwater. These locations would be tested in accordance with NYCDEP protocols prior to construction. If contaminated materials are found, they would be removed and disposed of in accordance with all City, State, and Federal regulations. In addition, the NED Plan would handle contaminated groundwater in



accordance with all regulations. The NED Plan involves potential beneficial impacts associated with cleanup of hazardous materials.

(d) Pathogens - N/A.

(e) Aesthetics - Temporary increase in turbidity.

(f) Others as Appropriate - N/A.

(3) Effects on Biota -

(a) Primary Production, Photosynthesis - Potential short-term disruption from excavation of ponds. Long-term effects expected to be positive from improved water quality. (Note: excavated ponds would be at a suitable elevation for volunteer wetland plants, contributing to positive impact).

(b) Suspension/Filter Feeders - No significant effects.

(c) Sight Feeders - Fishes and motile invertebrates are generally capable of avoiding areas of degraded water quality. Therefore significant effects are not anticipated. However, suspended sediments that settle out of the water column will smother eggs of demersal egg-laying fish that may spawn in the work area during the construction period.

(4) Action to Minimize Impacts - N/A.

d. Contaminant Determination –

The NED Plan may potentially involve the disturbance of soil and groundwater in areas where prior uses, regulatory database searches, and testing have indicated a potential for the presence of hazardous materials in the soil and/or groundwater. Under the NED Plan, these locations would be tested in accordance with NYCDEP protocols prior to construction. If contaminated materials are found, they would be removed and disposed of in accordance with all City, State, and Federal regulations. In addition, the NED Plan would handle contaminated groundwater in accordance with all regulations. The NED Plan involves potential beneficial impacts associated with cleanup of hazardous materials.

e. Aquatic Ecosystems and Organisms Determination -

(1) Effects on Plankton/Nekton - No significant resident aquatic resources are identified in the Project area. Potential short-term disruption from excavation of ponds.



- (2) Effects on Benthos - Some benthic species and some embryonic/juvenile nekton may be buried during LOP construction and disturbed during excavation of ponds.
- (3) Effects on Aquatic Food Web - Long-term adverse effects are not anticipated. The NED Plan is expected to result in improved water quality in the watershed.
- (4) Effects on Special Aquatic Sites -
 - (a) Sanctuaries and Refuges - N/A.
 - (b) Wetlands – The NED Plan will impact approximately 145 acres of existing *Phragmites* monoculture low quality wetland habitat. Of this acreage, the impact of 10.89 acres is related to the fill associated with the LOP Project feature resulting in a permanent loss of the existing wetlands. There are 117.25 acres of impacts associated with the interior drainage project feature (within Drainage Areas B, C, and E) being created for surface water detention as well as 16.5 acres of impact associated with the construction of the tidal wetland (mosaic of habitat) feature. There will be a long term positive impact to approximately 117.25 acres of native wetland vegetation associated with *Phragmites* removal activities (excavation of rhizomes and the reseeded with native vegetation). There will be further long term positive impacts to approximately 11.3 acres of native wetland vegetation due to the creation of this habitat via excavation for the interior drainage project feature in an area that was previously upland. Overall, these activities shall account for a net positive impact to native wetland vegetation. Taken as a whole, the NED Plan would produce a net significant positive impact on wetland habitats and the quality of wetlands in the Project area.
 - (c) Mud Flat - No impacts.
 - (d) Vegetated Shallows - N/A.
 - (e) Shoreline – The shoreline would be unaffected.
 - (f) Riffle and Pool Complexes - N/A.
- (5) Threatened and Endangered Species - No Federal or state endangered or threatened species are expected to be impacted.
- (6) Other Wildlife - No impacts.
- (7) Actions to Minimize Impacts - A Monitoring Plan has been developed (Appendix J) to evaluate the success of the natural protective features over a five (5) year period (post-construction).

f. Proposed Disposal Site Determination -



- (1) Mixing Zone Determination - Because of the short-term duration of the effects, the vertical and horizontal mixing zones are negligible.
- (2) Determination of Compliance with Applicable Water Quality Standards – The NYSDEC classifies this Project area as SB waters in the Lower Bay, and generally as I/C or C in the interior lower watershed. State water quality standards would not be exceeded by the NED Plan in the short-term. Over the long-term, water quality would be improved.
- (3) Potential Effects on Human Use Characteristic -
 - (a) Municipal and Private Water Supply - N/A
 - (b) Recreational and Commercial Fisheries - Implementation of the NED Plan would provide an opportunity to maintain and preserve the Project area’s many existing parks and other recreational facilities for the foreseeable future. The NED Plan also allows for the possibility that the risk reduction measures would enhance recreational opportunities. Minimal adverse impacts to sport fishery. Improved water quality would enhance recreational use and the commercial fisheries value of the Lower Bay.
 - (c) Water-Related Recreation - Improved water quality would enhance recreational use of the Lower Bay.
 - (d) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves - No adverse effects.
- g. Determination of Cumulative Effects on the Aquatic Ecosystem - None anticipated. All construction work will be in a beach/coastal plain habitat. Impacts associated with excavation and fill placements are anticipated to be short-term.
- h. Determination of Secondary Effects on the Aquatic Ecosystem - Beneficial impacts to aquatic ecosystem would occur through construction of tidal wetlands and improved freshwater wetland quality and habitats.

III. Findings of Compliance or Noncompliance

- a. No significant adaptations of the guidelines were made relative to this evaluation.
- b. Several alternatives to reduce the risk of damages from hurricane and storm surge flooding along the south shore of Staten Island were considered. There are no practicable alternatives under the jurisdiction of Section 404(b)(1) guidelines.



- c. The NED Plan does not appear to violate applicable state water quality standards or effluent standards.
- d. The proposed LOP placement and pond excavations would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.
- e. The NED Plan would have no adverse impact on endangered species or their critical habitats. (Endangered Species Act of 1973).
- f. The NED Plan would have no impact on marine sanctuaries designated by the Marine Protection, Research, and Sanctuaries Act of 1972.
- g. The proposed placement of the LOP and pond excavations would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Significant adverse effects on aquatic ecosystem diversity productivity and stability, and recreational, aesthetic and economic values would not occur.
- h. Appropriate steps to minimize potential adverse impacts of the discharge on aquatic systems include good engineering practices.
- i. On the basis of the guidelines, the proposed site for placement of the LOP and excavation of ponds is specified as complying with the requirements of these guidelines.

IV. Conclusions

Based on all of the above, the NED Plan is determined to be in compliance with the Section 404(b)(1) Guidelines, subject to appropriate and reasonable conditions, to be determined on a case-by-case basis, to protect the public interest.



Appendix C

Wetland Delineation Report

WETLAND DELINEATION REPORT

SOUTH SHORE OF STATEN ISLAND FEASIBILITY STUDY

**STATEN ISLAND,
RICHMOND COUNTY, NEW YORK**



**U.S. Army Corps of Engineers
New York District (CENAN-PL-E)
26 Federal Plaza
New York, New York 10278-0090**

September 2009

TABLE OF CONTENTS

SECTION	PAGE
1.0 INTRODUCTION.....	1
2.0 METHODS.....	2
2.1 SELECTION OF DELINEATION METHOD.....	2
2.2 BACKGROUND RESEARCH	2
2.3 ON-SITE FIELD DETERMINATION.....	2
2.3.1 Vegetation.....	3
2.3.2 Soils.....	4
2.3.3 Hydrology	4
2.3.4 GPS Mapping.....	4
3.0 SURVEY RESULTS.....	6
3.1 SITE DESCRIPTION.....	6
3.2 REVIEW OF BACKGROUND INFORMATION	6
3.2.1 NWI Mapped Wetlands	6
3.2.2 NYSDEC Mapped Freshwater Wetlands.....	7
3.3 RESULTS OF FIELD DELINEATION	7
3.3.1 Detailed Wetland Descriptions	10
4.0 SUMMARY	22
5.0 REFERENCES.....	23

LIST OF APPENDICES

APPENDIX A	FIGURES
	Figure 1. General Site Location Map
	Figure 2. Survey Area Limits
	Figure 3. National Wetland Inventory Maps (Sheets 1-5)
	Figure 4. NY State DEC Freshwater Wetland Maps (Sheets 1-3)
	Figure 5. Delineated Wetland Resources (Sheets 1-13)
APPENDIX B	PHOTOGRAPHIC RECORD
APPENDIX C	FIELD DATA FORMS



LIST OF TABLES

TABLE	PAGE
Table 1. Plant Affinity for Wetland Condition.....	3
Table 2. Summary of Wetlands in the Study Area.....	9



1.0 INTRODUCTION

This report documents the findings of a wetland delineation survey performed in an approximately 6.5-mile Study Area along the South Shore of Staten Island (SSSI), Richmond County, New York (Appendix A, Figure 1). The Study Area coincides with areas being considered for beach erosion control and storm damage protection measures in areas most susceptible to storm damage in the Borough of Staten Island.

The purpose of the delineation was to determine the presence and extent of areas within the Study Area that meet the criteria for wetland identification and other Waters of the United States, as established by U.S. Army Corps of Engineers (USACE) guidelines. Areas identified and delineated are potentially jurisdictional and regulated pursuant to Section 404 of the Clean Water Act (CWA), as well as the New York State Environmental Conservation Law, Article 24 (Freshwater Wetlands) and Article 25 (Tidal Wetlands). This report was prepared in support of a feasibility study being prepared by the USACE that identifies potential solutions to storm damage problems on the SSSI.

Solutions being considered to reduce the flooding problems historically experienced along in the Study Area include the construction of a structural line of protection to protect inland areas from storm surges. In addition, interior drainage areas would be used to detain and store interior stormwater runoff during storm or tidal events that create conditions preventing the immediate discharge of floodwater by gravity based outlets to the Lower New York Bay. Portions of the interior drainage areas would be dredged to create (or deepen) ponds, thereby increasing the floodwater storage capacity along the SSSI. Floodwater would then be transferred from the interior drainage areas back to Lower New York Bay by gravity-fed outlets and/or pumping stations, depending upon final approved project designs.

A wetland investigation was performed in September and October 2003, to accurately document and delineate the existing freshwater and tidal wetland resources within the Study Area. A supplemental delineation survey was performed in June and July of 2009 to verify these previously delineated boundaries, and to examine additional areas that were not included in the original survey. A total of 1,099 acres were surveyed.

Section 2.0 of this report describes the methods used for the collection and review of pertinent background information, and the delineation of wetlands within the Study Area. Section 3.0 presents the results of both a background information review, and the field identification and delineation of wetlands located within the Study Area. Section 4.0 of this report summarizes the survey results. Finally, Section 5 contains a list of references used to prepare this report.

Appendix A contains all of the figures, including a General Site Location Map, a map showing the survey limits, maps of resources mapped by the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) and New York State Department of Environmental Conservation (NYSDEC), and maps showing the field surveyed wetland boundaries. Appendix B contains photographic documentation of the surveyed areas. Appendix C contains the field data forms used to document the wetland determinations.



2.0 METHODS

This section provides a description of the methodology used for the delineation of jurisdictional wetlands. Background information was used to identify areas that were likely to contain wetlands, and this information supplemented the on-site field determination.

2.1 SELECTION OF DELINEATION METHOD

The delineation of wetlands on site was performed in accordance with the currently accepted state and federal methodology, presented in the 1987 *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1* (Environmental Laboratory 1987). Based on the level of detail required for the Project, the *Routine On-Site Determination Method* was selected as the most appropriate technique to meet the study objectives. This technique involves collection and review of existing available site background information, including soils, topography, and hydrology data, followed by an on-site survey and delineation. The following sections describe the methods used to delineate wetlands and waterbodies in the Study Area.

2.2 BACKGROUND RESEARCH

Prior to conducting fieldwork, a thorough review of existing site information was performed, including:

- United States Geological Survey (USGS) 7.5-minute series topographic quadrangle maps for the Arthur Kill NY-NJ, 1966, photorevised 1981 and Narrows NY-NJ 1966, photorevised 1998 (USGS 1966a, 1966b);
- New York State Department of State (NYSDOS) Digital Ortho Imagery for Richmond County, New York (NYSDOS 1994-1999);
- NYSDEC, New York State Freshwater Wetlands Map for Richmond County (NYSDEC 1990); and,
- United States Department of the Interior, USFWS NWI, electronic data for the Arthur Kill and Narrows (USFWS 1994, 1995).

Under normal circumstances, the published Natural Resource Conservation Service (NRCS) Soil Survey of the area would be obtained and reviewed. However, no published or draft soil survey presently exists for Richmond County, New York.

2.3 ON-SITE FIELD DETERMINATION

The *Routine On-site Determination and Delineation Method* involves a detailed survey of the soils, vegetation, and hydrologic indicators of a study area. Two teams consisting of two wetland ecologists per team performed field investigations in September and October 2003. Additionally, one team of two ecologists performed follow-up field investigations in June and July 2009 to verify the previously delineated boundaries and survey additional areas. The survey



was initiated with a walkover inspection of the entire Study Area to identify topographic, drainage, and vegetation features that would indicate the potential for jurisdictional wetland classification.

Based on the "three parameter" approach described in the *Corps of Engineers Wetlands Delineation Manual*, an area is defined as a wetland if, under normal circumstances, it exhibits the following three characteristics:

1. The land supports a dominance (i.e., > 50%) of hydrophytic vegetation;
2. The substrate is hydric soil; and,
3. The hydrological conditions of the area are such that the soil/substrate is at least periodically saturated or inundated during a significant portion of the growing season.

This definition and this survey of wetlands relates solely to vegetated wetlands, and does not include non-vegetated wetlands (such as tidal flats in coastal areas), which may be regulated under New York State tidal wetlands regulations.

To describe the wetlands within the Study Area, sampling points were established along the wetland boundary at representative locations within each plant assemblage encountered along the wetland boundary. At each sampling point, data regarding the vegetation, soil, and hydrology were collected from both the wetland and the upland side of the boundary line and recorded on field data forms (Appendix C). Specific methods for characterizing and evaluating the soils, vegetation, and hydrologic indicators within the Study Area are described below.

2.3.1 Vegetation

A hydrophyte is any plant that has the ability to grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content and depleted soil oxygen levels. The USFWS has prepared a list of wetland plant species for the Northeast, entitled *National List of Plant Species that Occur in Wetlands: Region 1* (Reed 1988). The plant species listed in this publication are classified based on their affinity for wetland conditions. These wetland indicator classifications were used for plant species found at the site. The wetland indicator classification assigned to each species listed is as follows:

Table 1. Plant Affinity for Wetland Condition.

Classification	Percent Occurrence In Wetlands
Obligate (OBL)	>99
Facultative Wetland (FACW)	67-99
Facultative (FAC)	34-66
Facultative Upland (FACU)	1-33
Non-Wetland (UPL)	<1

Source: Reed 1998.



In addition, a positive (+) or negative (-) symbol used in conjunction with one of the facultative indicator classes relates to a species preference to either the wetter or drier end of its indicator class, with the positive sign indicating a preference to the wetter end of the class. Species for which insufficient information is available for classification are listed in the USFWS list with a designation of NI (No Indicator) for regional status.

To accurately describe the vegetation at each sampling point, data on each horizontal strata or layer was collected. Vegetative strata for which dominants were determined included: (1) tree layer (> 3.0 inches diameter at breast height [dbh]); (2) sapling/shrub (< 3.0 inches dbh and > 3.2 feet in height); (3) woody vine; and (4) herb (herbaceous plants including graminoids, forbs, ferns, fern allies, herbaceous vines, and tree seedlings).

Dominant plant species in each major vegetation stratum (tree, sapling/shrub, woody vine, and herbaceous) were identified within 10-meter radius sample plots. The wetland indicator status of each species was assigned according to Reed 1988. Hydrophytic vegetation was determined to be present where more than 50 percent of the dominant species from all vegetation strata were classified as facultative (FAC), facultative wetland (FACW), or obligate wetland species (OBL).

2.3.2 Soils

At each sampling location, the soil profile was examined to a depth of at least 18 inches, or until auger refusal. Soils were characterized by determining soil texture, structure, and color. A soil core was extracted and examined for hydric indicators. Examples of hydric soil indicators include a histic epipedon, gleying, low-chroma soil color with or without mottles, and iron and manganese concretions. Matrix and mottle colors were identified using a Munsell Soil Color Chart (Munsell Color 1988). The depths to saturation and standing water were noted where present in the top 18 inches of the soil profile.

2.3.3 Hydrology

Each sampling location was examined for evidence of wetland hydrology. Indicators of wetland hydrology could include vegetated hummocks, water marks on tree trunks and other vegetation, evidence of inundation or ponding, morphological adaptations of plants, oxidized rhizospheres or root channels, drift lines, and drainage patterns. The presence or absence of wetland hydrology indicators was noted at each sampling location.

2.3.4 GPS Mapping

Wetland and waterbody boundaries were surveyed using a Trimble, Inc. (Sunnyvale, CA) Geo XH Global Positioning System (“GPS”). Wetland boundary flags were located in accordance with Trimble, Inc. sub-meter accuracy standards. Surveyed points that did not meet the sub-meter accuracy criteria due to restricted satellite reception or interference caused by heavy vegetation, topography, or densely developed areas were identified as such in field log books and the metadata associated with the GPS/GIS survey.

GPS data were differentially corrected using Pathfinder Office 4.10 software (Trimble Inc., Sunnyvale, CA) and commercial base station control points. A geo-referenced wetland



delineation boundary suitable for overlay onto Project maps and aerial photographs was created using a ArcMap, ArcView 9.3 (Environmental Systems Research Institute, Inc.; Redlands, CA) GIS mapping software.



3.0 SURVEY RESULTS

This section provides a site description, results of the background information review, field delineation/determination, and descriptions of identified jurisdictional wetlands and adjacent upland areas.

3.1 SITE DESCRIPTION

The Study Area consists of approximately 6.5 miles of coastline along the south shore of the Borough of Staten Island, Richmond County, New York, extending along Lower New York Bay and Raritan Bay. The approximate western and eastern limits of the Study Area are the western edge of land in Crescent Beach at the mouth of Great Kills Harbor, and the easternmost point of land within Fort Wadsworth at the Narrows

The survey areas that were reviewed in this wetland delineation survey are depicted on the map in Appendix A, Figure 2. A total of 1,099 acres were included in the survey area.

The entire Study Area is included within the city limits of the City of New York Borough of Staten Island, and consists of a series of communities. The principal communities along the SSSI from west to east are Great Kills, Oakwood Beach, New Dorp Beach, Eltingville Beach, Midland Beach, Ocean Breeze/Graham Beach, and South Beach. Adjacent to Staten Island's west is the New Jersey shoreline of Raritan Bay, which extends from the community of South Amboy to the Sandy Hook peninsula. East of Staten Island is Brooklyn on the Narrows, Coney Island on the Lower New York Bay, and Rockaway Point on the Atlantic Ocean, all of which are located on Long Island. The approach to Lower New York Bay from deep water in the ocean is through a 6-mile wide opening between Sandy Hook, New Jersey, and Rockaway Point, New York.

3.2 REVIEW OF BACKGROUND INFORMATION

Background information research included review of NWI Wetland Maps and NYSDEC Freshwater Wetland Maps. Typically, soil surveys are examined for the presence of hydric soils, although there is currently no published soil data for the survey area.

3.2.1 NWI Mapped Wetlands

The NWI wetland maps (Appendix A, Figure 3, Sheets 1 through 5) identify a number of estuarine and palustrine wetland systems in the Study Area (USFWS 1994, 1995). In all, a total of 416 acres of NWI mapped wetlands are present within the survey area.

The wetlands identified in the Crescent Beach area (Figure 3, Sheet 1) consist of a small palustrine, narrow-leaved persistent emergent, semi-permanently flooded (PEM1F) wetland and a complex of estuarine, intertidal, unconsolidated shore, irregularly flooded (E2US2P) and estuarine, intertidal, narrow-leaved persistent emergent, regularly flooded (E2EM1N) wetlands.

The estuarine wetlands in the Oakwood Beach area (Figures 3, Sheet 2) are hydrologically connected by Oakwood Creek and are identified as a complex of several wetland types.



Specifically, these wetlands consist of: estuarine, intertidal, persistent emergent, common reed dominated, irregularly flooded (E2EM5P) wetlands; E2EM1N wetlands; and, palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A) and seasonal tidal (PFO1R) wetland components. A complex of one estuarine and palustrine wetlands are identified on the east side of the Oakwood Beach area and are hydrologically connected to the others by means of an excavated drainage system. This complex includes E2EM5P, palustrine forested, and palustrine scrub-shrub broad leaved deciduous, seasonal tidal (PFO1R, PSS1R) wetlands.

The palustrine systems identified in the Midland Beach area (Figure 3, Sheet 4) consist of large palustrine, common reed dominated, seasonally flooded/saturated (PEM5E) wetlands with a few, smaller associated PFO1A and palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated (PFO1Eh) components. These are hydrologically connected by a series of streams that flow throughout the wetland complexes.

The palustrine systems identified within the survey limits between the South Beach area and Midland Beach (Figure 3, Sheets 4 and 5) are classified as palustrine emergent seasonally flooded (PEM1C) wetlands. Many small PEM1C systems are scattered throughout the area adjacent to / outside of the designated survey limits.

The wetlands identified in the upper South Beach area (Figure 3, Sheet 5) consist of a small PEM5E wetland and a larger complex of palustrine, narrow-leaved emergent, semi-permanently flooded (PEM5F) wetlands with smaller associated palustrine, broad-leaved deciduous forested, seasonally flooded/saturated (PFO1E) and palustrine, unconsolidated bottom, permanently flooded (PUBH) components.

3.2.2 NYSDEC Mapped Freshwater Wetlands

The NYSDEC Freshwater Wetlands Map (Appendix A, Figure 4, Sheets 1 through 3) identifies a number of state-designated freshwater wetland areas within the Study Area. These wetlands are located in the Oakwood Beach area, the Midland Beach area, and the South Beach area. No state-designated freshwater wetlands were identified within the Crescent Beach survey area.

Although there are numerous, separately mapped areas, the NYSDEC has grouped a number of them together based on their geographic area, and labeled them as four different state-designated wetlands: NA-10, NA-9, NA-8, and NA-7 (Figure 4, sheets 1 through 3). In all, a total of approximately 386 acres of NYSDEC mapped freshwater wetlands are present within the survey area.

3.3 RESULTS OF FIELD DELINEATION

The Study Area is continually under development pressure as indicated by ongoing construction in and around the fringes of the Study Area. In addition, review of aerial photography has concluded that many wetland areas previously identified on NYSDEC and NWI wetland maps have been converted to residential areas. Vegetated uplands in the SSSI Study Area consist of residential areas; maintained lawns; recreational fields; small patches of scrub-shrub habitat dominated by Japanese knotweed (*Polygonum cuspidatum*), multiflora rose (*Rosa multiflora*), winged sumac (*Rhus copallinum*) and frost grape (*Vitis vulpina*); forests dominated by black



locust (*Robinia psuedoacacia*), oak (*Quercus* spp.), and tree of heaven (*Ailanthus altissima*); and, herbaceous and vine communities dominated by various grasses, goldenrods (*Solidago* spp.), annual ragweed (*Ambrosia artemisiifolia*), Japanese honeysuckle (*Lonicera japonica*), field bindweed (*Convolvulus arvensis*), and poison ivy (*Toxicodendron radicans*).

Field identification and delineation (Figure 5, Sheets 1 through 13) revealed eighteen (18) palustrine and twelve (12) estuarine wetlands within the survey area. A total of approximately 297.76 acres of wetlands were found to be present in the survey area. Table 2 presents the wetland identification numbers and classifications of each wetland surveyed, in order generally from south to north along the Study Area. A detailed narrative description of each wetland is provided in Section 3.3.1.

In addition to vegetated wetlands, unvegetated rocky intertidal zone (RI-1) and clam flat (CF-1) features were delineated in the Crescent Beach survey area due to the proximity of potential project alternatives to these resources (Appendix A, Figure 5, Sheet 1). Also, the high tide line was delineated along the beach areas throughout the entire approximately 6.5-mile-long survey area. The natural high tide drift line was mapped by locating the highest wrack along the coastline. The location of high tide line is depicted on the Figure 5 series maps (Appendix A).



Table 2. Summary of Wetlands in the Study Area

Survey Area	Wetland Number	Classification ¹	Wetland Acres in Survey Area
Crescent Beach	LM-1	E2EM1P	0.02
	LM-2	E2EM1P	0.09
	LM-3	E2EM1P	0.22
	CB-1	PEM5E	0.81
	LM-4	E2EM1N	0.003
	LM-5	E2EM1N	0.002
	LM-6	E2EM1N	0.001
	CB-2	PEM5E/PSS1E	0.10
Oakwood Beach	A-1 (2009 ID: W11)	E2EM5P	50.61
	A-2	E2EM5P	0.03
	A-3	E2EM5P	0.29
	A-4	E2EM5P	44.34
	W13 (2003 ID: A-5)	E2EM5P	65.89
	W15	E2EM5P	5.30
	W14	PFO1E	0.16
Midland Beach	W10	PEM5E	6.88
	W9	PEM5E	1.32
	W7 (2003 ID: C-4)	PEM5E	15.23
	W8	PEM5E	1.40
	W5	PEM5E	0.07
	C-1	PEM5E	16.94
	W2	PEM5E	1.31
	W4	PEM5E	0.30
	W6	PEM5E	0.80
	W3	PEM5E/PSS1E	17.14
	C-2	PEM5E	0.19
	C-3	PEM5E	13.56
	W12	PFO1E	9.02
South Beach	W1	PSS1E/PEM1E	2.31
	E-1	PEM5F	43.42
TOTAL			297.76

¹ Classifications based on Cowardin et al. 1979.

- E2EM1P estuarine intertidal, persistent emergent vegetation, irregularly flooded
- E2EM1N estuarine intertidal, persistent emergent vegetation, regularly flooded
- E2EM5P estuarine intertidal, *Phragmites australis* emergent vegetation, irregularly flooded
- PEM1E palustrine emergent, persistent vegetation, seasonally flooded/saturated
- PEM5E palustrine emergent, *Phragmites australis* emergent vegetation, seasonally flooded/saturated
- PEM5F palustrine emergent, *Phragmites australis* emergent vegetation, semi-permanently flooded
- PSS1E palustrine scrub-shrub, broad-leaved deciduous, seasonally flooded/saturated
- PFO1E palustrine forested, broad-leaved deciduous, seasonally flooded/saturated



3.3.1 Detailed Wetland Descriptions

Wetland LM-1

Wetland LM-1 is a small estuarine intertidal/persistent emergent, irregularly flooded (E2EM1P) community located immediately adjacent to the Armstrong Stormwater Outfall surrounded by an area of beach sand. The herbaceous layer is dominated by a densely populated monotypic stand of saltmarsh cord grass (*Spartina patens*). The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland LM-1 consists of a 3-inch-deep, very dark grayish brown (10YR 3/2) organic silt A horizon. Auger refusal was met below this horizon where large stone rip-rap was encountered. Wetland hydrology is driven by the diurnal tide cycle. This wetland is located in a larger area of wetland depicted as an estuarine intertidal unconsolidated shore, sand substrate (E2US2P) wetland.

Wetland LM-2

Wetland LM-2 is a small estuarine intertidal/persistent emergent (E2EM1P) community located approximately 55 feet to the northeast of Wetland LM-1. The herbaceous layer is dominated by a densely populated monotypic stand of saltmarsh cord grass. The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland LM-2 consists of a 14-inch-deep, dark grayish brown (10YR 4/2) organic silt O_A horizon. Below this horizon is a 20-inch-deep, B horizon consisting of a very dark grayish brown (2.5Y 3/2) silt. Wetland hydrology is driven by the diurnal tide cycle. This wetland is located in a larger area of wetland depicted as an estuarine intertidal unconsolidated shore, sand substrate (E2US2P) wetland.

Wetland LM-3

Wetland LM-3 is a small estuarine intertidal/persistent emergent, irregularly flooded (E2EM1P) community located approximately 120 feet to the east of Wetland LM-2. The herbaceous layer is dominated by a densely populated monotypic stand of saltmarsh cord grass. The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland LM-3 consists of a 4-inch-deep, very dark grayish brown (10YR 3/2) organic silt O_A horizon. Refusal was met below this horizon where large stone rip-rap was encountered. The saltmarsh cord grass is growing in areas in between the rip-rap where silt has accumulated. Wetland hydrology is driven by the diurnal tide cycle. This wetland is located in a larger area of wetland depicted as an estuarine intertidal unconsolidated shore, sand substrate (E2US2P) wetland.



Wetland CB-1

Wetland CB-1 is a palustrine emergent (PEM5E) community located southeast of the intersection of Tennyson Drive and Glover Street that appears to have been impacted by past fill activities. The herbaceous layer is dominated by common reed (*Phragmites australis*), soft rush (*Juncus effusus*), purple loosestrife (*Lythrum salicaria*), and flat-top fragrant goldenrod (*Euthamia graminifolia*). The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland CB-1 consists of a 3-inch-deep, dark brown (10YR 3/3), sandy loam A horizon. Below this horizon is a 3- to 8-inch-deep, dark grayish brown (10YR 4/2) sandy loam B horizon with large faint yellowish brown (10YR 5/4) mottles. Refusal was met at 8 inches where large stones and gravel were encountered. Hydric soil indicators include the presence of reducing conditions. The primary indicator of wetland hydrology was saturation in the upper 12 inches. A secondary indicator of wetland hydrology included water stained leaves. A portion of this wetland is identified on NWI maps. Wetland CB-1 is not identified on NYSDEC wetland maps.

Wetland LM-4

Wetland LM-4 is a very small estuarine intertidal/persistent emergent, regularly flooded (E2EM1N) community located at the base of the existing seawall along Crescent Beach. The herbaceous layer is a sparsely populated monotypic colony of saltmarsh cord grass. The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland LM-4 consists of a 3-inch-deep, very dark grayish brown (10YR 3/2) organic silt O_A horizon. Refusal was met below this horizon where large stone rip-rap was encountered. The saltmarsh cord grass is growing in between rip-rap associated with old pilings. Wetland hydrology is driven by the diurnal tide cycle. This wetland is located in a larger area of wetland depicted as an estuarine intertidal unconsolidated shore, sand substrate (E2US2P) wetland.

Wetland LM-5

Wetland LM-5 is a very small estuarine intertidal/persistent emergent, regularly flooded (E2EM1N) community located at the base of the existing seawall along Crescent Beach. The herbaceous layer is a sparsely populated monotypic colony of saltmarsh cord grass. The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland LM-5 consists of a 3-inch-deep, very dark grayish brown (10YR 3/2) organic silt O horizon that is perched on top of an olive brown (10YR 4/3) beach sand. Wetland hydrology is driven by the diurnal tide cycle. This wetland is located in a larger area of wetland depicted as an estuarine intertidal unconsolidated shore, sand substrate (E2US2P) wetland.



Wetland LM-6

Wetland LM-6 is an extremely small estuarine intertidal/persistent emergent, regularly flooded (E2EM1N) community located amongst stone rip-rap associated with old pilings. The herbaceous layer is a sporadically populated monotypic patch of saltmarsh cord grass. The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

The saltmarsh cord grass is growing in between the stone rip-rap in an olive brown (10YR 4/3) beach sand. Wetland hydrology is driven by the diurnal tide cycle. This wetland is located in a larger area of wetland depicted as an estuarine intertidal unconsolidated shore, sand substrate (E2US2P) wetland.

Wetland CB-2

Wetland CB-2 is a PEM5E/palustrine scrub shrub (PSS1) community in an isolated depression located northeast of the intersection of Tennyson Drive and Goodall Street. The herbaceous layer is dominated by common reed and hedge bindweed (*Calystegia sepium*). The shrub/sapling layer is dominated by slippery elm (*Ulmus rubra*). The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland CB-2 consists of a 3-inch-deep, black (10YR 2/1), loam A horizon. Below this horizon is a 6- to 12-inch-deep, very dark grayish brown (10YR 3/2) fine sandy loam B horizon with many small faint dark brown (7.5YR 3/4) mottles. The C horizon was a 20⁺-inch-deep, dark brown (7.5YR 3/3) coarse sand layer. Hydric soil indicators include the presence of reducing conditions. The primary indicator of wetland hydrology was watermarks on vegetation. Wetland CB-2 is not identified on NWI or NYSDEC wetland maps.

Wetland A-1

Wetland A-1 is a large wetland complex characterized by an estuarine emergent (E2EM5P) community in the Oakwood Beach area, adjacent to Gateway National Recreation Area. The dominant species within the emergent community is common reed with lower densities of jewelweed (*Impatiens capensis*) and bugleweed (*Lycopus americana*).

Soil investigation revealed a 4-inch deep A horizon of black (10YR 2/1) sandy loam. Beneath this layer was a B horizon that extended beyond 18 inches and was comprised of a dark brown (7.5YR 3/2) loamy sand with some distinct, strong brown (7.5YR 4/6) mottles and prominent streaking from organic matter transport. The distinct mottling and organic streaking in the B horizon meet USACE hydric criteria for classification of sandy hydric soils. The adjacent upland plot failed to exhibit organic streaking or distinct mottling below the A horizon and thus failing to meet hydric soil criteria.



Primary indicators of hydrology in the wetland include soil saturation within 12 inches of the soil surface. Additionally, the western area of the wetland appears to be a large slough, with inundation visible in the center and increasing with proximity to the shore. Portions of wetland A-1 are identified on both NWI and NYSDEC wetland maps.

Wetland A-2

Wetland A-2 is an estuarine emergent (E2EM5P) community located southeast of the Oakwood Creek Tide Gate. The herbaceous layer is dominated by a monotypic stand of upright sedge (*Carex stricta*). The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland A-2 consists of a 12⁺-inch deep black (10YR 1/1), sandy loam B horizon with many distinct red (2.5YR 5/8) and many distinct gray (10YR 6/1) mottles. Hydric soil indicators observed present evidence of reducing conditions. Primary indicators of wetland hydrology include inundation and saturated soils in the upper 12 inches. Secondary indicators including oxidized root channels in the upper 12 inches of the soil horizon. A portion of this wetland is identified on NWI maps.

Wetland A-3

Wetland A-3 is an estuarine emergent (E2EM5P) community located southeast of the Oakwood Creek Tide Gate. The herbaceous layer is dominated by a monotypic stand of common reed. The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland A-3 consists of a 3-inch-deep, black (7.5YR 2.5/1), sandy loam A horizon. Below this horizon is a very dark grayish brown (10YR 3/2), sand B horizon with many faint pale brown (10YR 6/3) and few distinct yellowish red (5YR 4/6) mottles that extends beyond 12 inches. Hydric soil indicators observed present evidence of reducing conditions. Secondary indicators of wetland hydrology include oxidized root channels in the upper 12 inches of the soil horizon and water-stained leaves. A portion of this wetland is identified on NWI and NYSDEC wetland maps.

Wetland A-4

Wetland A-4 is an estuarine emergent (E2EM5P) community with a small associated palustrine forested (PFO1A) component. The herbaceous layer in this large wetland is dominated by a monotypic stand of common reed. The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland A-4 consists of a 0.5-inch-deep, black (10YR 2/1), loamy sand A horizon. Below this horizon is a black (2.5Y 2.5/1), loamy sand B horizon with many distinct red (2.5YR 4/7) and few distinct red (2.5YR 5/8) mottles that extends beyond 12 inches. Hydric soil indicators observed present evidence of reducing conditions. Primary indicators of wetland hydrology include inundation and saturated soils in the upper 12



inches. Secondary indicators including oxidized root channels in the upper 12 inches of the soil horizon. This wetland is clearly visible in aerial photographs and is identified on NWI and NYSDEC wetland maps.

Wetland W13

Wetland W13 is a very large estuarine emergent wetland (E2EM5P) bordered on the west by Kissam Avenue, on the north by residences along Tysens Lane and Milton Avenue, and a long the south by a constructed berm along the beach. The eastern boundary is formed by a very dense upland forest behind the Cedar Grove Beach community. This wetland includes a verification of the previously delineated area (2003) and extension (in 2009) of the previously delineated wetland WA-5, which comprises the western border along Kissam Avenue. Common reed is dominant throughout the wetland, with lower densities of jewelweed, chairmaker's bulrush (*Schoenoplectus americanus*), and poison ivy. The composition of hydrophytic species throughout the wetland exceeds 50% and thereby meets USACE criteria for wetland vegetation.

Several examinations of the soils were performed due to the large size of the wetland. Soils at the north side consisted of a 12-inch deep A horizon of black (10YR 2/1) sapric muck overlying a B horizon of black (10YR 2/1) mucky mineral soil. The south side of the wetland appears to have been subjected to a greater amount of past disturbance, and consisted of 2 inches of black (10YR 2/1) mucky mineral soil as the A horizon. The B horizon was observed to be a thin, 0.5-inch layer of dark grey (7.5YR 4/1) silty clay loam overlying a very dark gray (10YR 3/1) sandy loam that extended to auger refusal at 10 inches. Both plots meet USACE hydric soil criteria by exhibiting a chroma of 1 or a histic epipedon.

The primary hydrology indicator throughout the wetland was inundation, which generally ranged from 2 to 6 inches in depth. This wetland is depicted on NWI and NYSDEC wetland maps.

Wetland W15

Wetland W15 is a large estuarine emergent wetland (E2EM5P) that is in close proximity to wetland W13. It is bordered to the north by Roma Avenue and residential development, while the other boundaries are formed by dense upland scrub-shrub and forest vegetation such as tree of heaven, Japanese knotweed, multiflora rose, and black locust. The vegetation within the wetland is dominated by common reed, with a low density of jewelweed and frost grape around the exterior edges. The composition of hydrophytic plant species in this wetland exceeds 50% and thereby meets USACE criteria for wetland vegetation.

Soil examination revealed a 6-inch deep, black (10YR 2/1) A horizon of sapric muck. This is underlain to a depth greater than 18 inches by a black (2.5Y 2.5/1) silty clay loam B horizon. The histic epipedon and chroma of 1 in the B horizon meet USACE criteria for hydric nonsandy soils.

The primary indicator of wetland hydrology is inundation to an average depth of 4 inches. There were no primary or secondary indicators of wetland hydrology in the upland areas. This wetland is identified on NWI and NYSDEC wetland maps. These maps also depict the adjacent areas as



palustrine forested wetlands, although investigation revealed that the surrounding forests lack a sufficient composition of hydrophytes as well as wetland hydrology and therefore fail to meet USACE criteria for designation as federally jurisdictional wetlands.

Wetland W14

Wetland W14 is a small palustrine forested wetland (PFO1E) along the south bank of a stream/drainage channel that passes through a wooded parcel bordered by Midland, Lincoln, and Boundary avenues. The entire parcel appears to have been subject to filling in the past. The wetland is dominated by a variety of species, including red maple (*Acer rubrum*) and slippery elm in the overstory, with northern arrowwood (*Viburnum recognitum*), marshpepper knotweed (*Polygonum hydropiperoides*), and Japanese knotweed. The composition of hydrophytes in this wetland exceeds 50% and thereby meets USACE criteria for wetland vegetation.

The soils in this wetland consist of an 8-inch deep, black (10YR 2/1) sandy clay loam A horizon. The B horizon extends beyond 16 inches and is a very dark gray (10YR 3/1) sandy clay loam with many prominent gray (2.5YR 5/1) mottles. A chroma of 1 with prominent mottling meets USACE hydric criteria for nonsandy soils. The upland soils exhibit a chroma of 3 with no mottling below the A horizon and thereby fail to meet USACE hydric soils criteria for nonsandy soils.

The primary indicators of hydrology observed included saturation within 12 inches of the soil surface as well as drainage patterns throughout the wetland. There were no primary or secondary hydrology indicators observed in the surrounding upland areas.

This wetland is identified on NWI wetland maps, although it is not depicted on NYSDEC wetland maps.

Wetland W10

Wetland W10 is a large palustrine emergent (PEM5E) wetland between Freeborn Street and Nugent Avenue. This wetland is the northmost wetland surveyed along the stream/drainage channel that provides the hydrology for wetlands W9, W8, W7, and WC-1. The boundary between upland and wetland is obvious, having been filled for road construction and residential development. The dominant species within the emergent community is common reed, with a low density of frost grape along the exterior edges. The composition of hydrophytic species in this wetland exceeds 50% and therefore meets USACE criteria for wetland vegetation.

The soils in wetland W10 contain a 7-inch deep, very dark grayish brown (10YR 3/2) sapric muck soil prior to auger refusal. This soil is considered histic and thereby meets USACE hydric criteria for classification as wetland soil.

The primary indicators of wetland hydrology observed included inundation, soil saturation, and drift lines. This wetland is clearly visible in aerial photographs and is identified on NWI and NYSDEC wetland maps.



Wetland W9

Wetland W9 is a palustrine emergent wetland (PEM5E) with a palustrine scrub-shrub (PSS1E) component bordered by Olympia Boulevard and Freeborn Street, and hydrologically connected to wetlands W7 and W10 via culverts. The emergent component is entirely dominated by common reed, with the scrub-shrub community consisting of frost grape, spicebush (*Lindera benzoin*), and poison ivy. The hydrophyte composition within both community types exceeds 50% and therefore meets USACE criteria for wetland vegetation.

Investigation of the soils in wetland W9 revealed a 14-inch deep, black (10YR 2/1) mucky mineral A horizon. Beyond 14 inches was a dark brown (7.5YR 3/2) sand B horizon. This soil exhibits a chroma of 1 at 10 inches in depth, and therefore meets USACE hydric soil criteria.

The primary indicators of hydrology in the wetland were inundation and drift lines. Standing water was observed within 3 feet of Olympia Boulevard. This wetland is clearly visible in aerial photographs and is identified on NWI and NYSDEC wetland maps.

Wetland W7

Wetland W7 is a large palustrine emergent (PEM5E) wetland bordered on the north by Olympia Boulevard the south by Father Capodanno Boulevard, the west by Hunter Avenue, and east by Jefferson Avenue and Graham Boulevard. Abandoned remnants of Jefferson Avenue, Baden Place, and Colony Avenue are visible on aerial imagery, but were included where they were observed to support hydrophytes (i.e., the pavement had deteriorated to a point that allowed for plant growth and the return of wetland hydrology). The vegetation in the wetland was observed to be a nearly monotypic stand of common reed, although low densities of jewelweed, frost grape, and Hercules club (*Aralia spinosa*) did occur. The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criteria for wetland vegetation.

Examination of the soil revealed a 3-inch deep, black (10YR 2/1) sandy clay loam A horizon underlain to a depth of 10 inches by a very dark grayish brown (10YR 3/2) sandy clay loam B horizon that displayed many prominent strong brown (7.5YR 4.6) mottles. Auger refusal at 10 inches was caused by coarse fragments from past road construction. This soil exhibits a matrix chroma of 2 with mottling below the A horizon and thereby meets the USACE criteria for nonsandy wetland soils.

Primary indicators of hydrology in the wetland include soil saturation in the upper 12 inches, and secondary indicators observed were water stained leaves and the FAC neutral test. This wetland is clearly visible in aerial photographs and is identified on NWI and NYSDEC wetland maps.

Wetland W8

Wetland W8 is a palustrine emergent wetland (PEM5E) in close proximity to W7, separated by Jefferson Avenue and Patterson Avenue. This wetland also incorporates open water as an effect of excavation that was part of the New York City Department of Environmental Protection (DEP), Staten Island Bluebelt project. The vegetation is a very dense mix of common reed and



poison ivy, with a low density of sedges and northern arrowhead (*Sagittaria latifolia*) on the banks of the open water. The composition of hydrophytic plant species in this wetland exceeds 50%, thus meeting the USACE criteria for wetland vegetation.

The soils consisted of a 10-inch deep, very dark gray (10YR3/1) sandy clay loam A horizon. Auger refusal was at 10 inches, likely due to past road construction and fill. Although considered problematic, this soil contains a chroma of 1 at ten inches in depth, and therefore meets USACE hydric criteria for nonsandy soils.

The primary indicator of hydrology in the wetland was soil saturation at 4 inches in depth. This wetland is clearly visible in aerial photographs and is identified on NWI wetland maps.

Wetland W5

Wetland W5 is a small palustrine emergent (PEM5E) wetland on the corner of Graham Boulevard and Baden Place. It is dominated by a monotypic stand of common reed. The composition of hydrophytic plant species in the wetland exceed 50% and thereby meets the USACE criteria for wetland vegetation.

Due to its small size and close proximity to roads and residential development, the soil in the wetland is composed entirely of fill material. Auger refusal was at 5 inches in depth, although this soil did contain hydric indicators in the form of a very dark gray (10YR 3/1) sandy loam prior to refusal. The chroma is 1 and thereby meets the criteria for nonsandy, but problematic hydric soils. The adjacent upland soils are also composed of fill, but they lack any hydric indicators such as mottling or low chroma.

The primary indicator of hydrology is inundation throughout the wetland, which meets USACE criteria for wetland hydrology. This wetland is clearly visible in aerial photographs and is included on NWI wetland maps.

Wetland C-1

Wetland C-1 is a large palustrine emergent (PEM5E) community located between Olympia Boulevard and Father Capodanno Boulevard. The herbaceous layer is dominated by a monotypic stand of common reed. The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland C-1 consists of a 14-inch-deep, black (10YR 2/1), mucky O_A horizon. Below this horizon is a dark brown (10YR 3/2), clayey sand B horizon with few distinct yellowish red (5YR 5/8) mottles. Hydric soil indicators include the presence of a histosol, evidence of reducing conditions, high organic content in the surface layer in sandy soils, and organic streaking in sandy soils. Primary indicators of wetland hydrology include drainage patterns in the wetland and saturated soils in the upper 12 inches. This wetland is clearly visible in aerial photographs and is identified on NWI and NYSDEC wetland maps.



Wetland W2

Wetland W2 is a palustrine emergent (PEM5E) wetland community dominated by a nearly monotypic stand of common reed, with a very low density of jewelweed along vegetation edges. There are also extensive areas of open water within the wetland, apparently excavated as a part of the DEP Bluebelt project. The composition of hydrophytic plant species within the wetland exceeds 50% and thereby meets the USACE criteria for wetland vegetation.

Upon examination, the soils in wetland W2 were found to consist of a black (10YR 2/1) silt loam A horizon to a depth of 4 inches. Below this was a very dark gray (2.5Y 3/1) sandy clay loam B horizon to 9 inches in depth. Below an abrupt boundary at 9 inches, and extending beyond 18, was a layer of very dark gray (10YR 3/1) sand. No mottling was observed in the subsurface layer, but a chroma of 1 without mottles immediately below the A horizon meets USACE criteria for nonsandy hydric soils.

The primary indicator of hydrology observed was soil saturation within 12 inches of the soil surface. Inundation was also visible in the immediate vicinity of the plot. This wetland is clearly visible in aerial photographs and is identified on NWI and NYSDEC wetland maps.

Wetland W4

Wetland 4 is a small palustrine emergent (PEM5E) wetland south of Hylan Boulevard, dominated by common reed, with low densities of box elder (*Acer nigrum*) and frost grape. The composition of hydrophytic species exceeds 50% and thereby meets USACE criteria for wetland vegetation.

The surface soil layer in this wetland is a 2-inch deep, very dark gray (10YR3/1) silt loam A horizon. The subsurface layer is a black (10YR 2/1) silty clay loam B horizon to 10 inches in depth. A layer of olive brown (2.5Y 4/3) sand extends from 10 to beyond 18 inches. The layer immediately below the A horizon contains a chroma of 1 and thereby meets USACE criteria for nonsandy wetland soils.

The primary indicators of hydrology in this wetland are inundation and soil saturation. Standing water was observed throughout the well-defined wetland and thereby meets USACE criteria for wetland hydrology. This wetland is clearly visible in aerial photographs and is identified on NWI and NYSDEC wetland maps.

Wetland W6

Wetland W6 is a palustrine emergent (PEM5E) wetland south of Hylan Boulevard, hydrologically connected to wetland W3 by a large stream/drainage channel to the west. The dominant vegetation in W6 is common reed, with much lower densities of jewelweed and box elder. This composition of hydrophytes exceeds 50% and thereby meets USACE criteria for wetland vegetation.



Field investigation revealed that the soils are composed of a 3 inch O horizon of black (10YR 2/1) hemic organic matter. This is underlain to a depth of 6 inches by a very dark gray (10YR 3/1) silty loam A horizon. The B horizon extends to auger refusal at 12 inches, and is a black (10YR 2/1) sandy loam. A chroma of 1 and a sulfidic odor upon removal of the soil sample meets the USACE criteria for classification as nonsandy wetland soils.

The primary hydrology indicators observed include inundation and soil saturation. This wetland is clearly visible in aerial photographs and is identified on NWI and NYSDEC wetland maps.

Wetland W3

Wetland W3 is a large palustrine emergent (PEM5E) wetland that incorporates the banks and floodplain of a large stream/drainage channel, with a palustrine scrub-shrub (PSS1E) component. The community is dominated by a monotypic stand of common reed in the interior, with silver maple (*Acer saccharinum*) and gray birch (*Betula populifolia*) shrubs/saplings that increase in density with distance from the stream toward the exterior edges. The composition of hydrophytic species in this wetland exceeds 50% and thereby meets USACE criteria for wetland vegetation.

The soils consist of a 4-inch deep, very dark gray (10YR 3/1) clay loam A horizon in the scrub-shrub community. The subsurface horizon extends beyond 14 inches and is composed of a dark gray (2.5Y 4/1) clay loam B horizon. The emergent community consisted of a very dark gray (10YR 3/1) mucky mineral A horizon that extended beyond 16 inches in depth. Both soils exhibit a chroma of 1 below the A horizon or at 10 inches in depth, and thereby meets USACE criteria for classification as nonsandy wetland soils.

Primary indicators of hydrology found in the wetland community are soil saturation at the surface and drift lines in the form of leaves and stems of common reed that has been deposited throughout the wetland.

This wetland is clearly visible in aerial photographs and is identified on NWI and NYSDEC wetland maps. Note that an area on the north end of W3 appears to have a wetland signature on aerial imagery. Upon field investigation, this area was determined to be upland due to the absence of wetland hydrology and recent soil indicators. This soil appears to have been deposited from dredging operations that have taken place in the past along the nearby channel.

Wetland C-2

Wetland C-2 is a palustrine emergent (PEM5E) community that occupies a small area northeast of Slater Boulevard adjacent to a residential area. The herbaceous layer is dominated by a monotypic stand of common reed. The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criteria for wetland vegetation.

Field investigation revealed a history of prior fill activities in Wetland C-2. Soils consists of a 3-inch-deep, very dark brown (10YR 2/2), fine sandy loam A Horizon. Below this horizon is a brown (10YR 4/3), fine sandy loam B horizon with many faint dark brown (7.5YR 3/4) and few



faint dark gray (10YR 4/1) mottles. Hydric soil indicators include evidence of reducing conditions and organic streaking in sandy soils. The primary indicator of wetland hydrology is drainage patterns in the wetland. Secondary indicators of wetland hydrology include oxidized root channels in the upper 12 inches and water-stained leaves. This wetland is not identified on NWI or NYSDEC wetland maps.

Wetland C-3

Wetland C-3 is a palustrine emergent (PEM5E) community with a small associated palustrine forested (PFO1A) component. This large wetland occupies the area between Seaview Avenue and Slater Boulevard. The herbaceous layer is dominated by a monotypic stand of common reed. The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criteria for wetland vegetation.

Field investigation revealed that the soil in Wetland C-3 consists of a 24-inch-deep, black (2.5Y 2/1), mucky loam O horizon. Hydric soil indicators include the presence of a histosol. Primary indicators of wetland hydrology include drainage patterns in the wetland, saturation in the upper 12 inches, watermarks, drift lines, and sediment deposits. Secondary indicators of wetland hydrology include water-stained leaves. Depth to free water in the soil pit was 2 inches. This wetland is clearly visible in aerial photographs and is identified on NWI and NYSDEC wetland maps.

Wetland W12

Wetland W12 is a palustrine forested wetland (PFO1E) with a common reed dominated palustrine emergent (PEM5C) component. It is bordered by Stobe Avenue to the west, Naughton Avenue to the east, Zoe Street to the north, and Husson Street to the south. The dominant species in this wetland include red maple, spicebush, multiflora rose, small enchanter's nightshade (*Ciraea alpina*), and skunk cabbage (*Symplocarpus foetidus*). The composition of hydrophytic vegetation in this wetland exceeds 50% and thereby meets USACE criteria for wetland vegetation.

The soils consist of an 8-inch deep A horizon of black (10YR 2/1) sandy loam underlain to a depth of 12 inches by a gray (2.5Y 5/1) B horizon of silty clay. A layer of very dark gray (2.5Y 3/1) loamy sand extended from 12 to greater than 16 inches into the B horizon as well. These soils exhibit a chroma of 1 below the A horizon and thereby meet USACE hydric criteria for nonsandy wetland soils.

The primary hydrology indicators observed in the wetland are drainage patterns and sediment deposits. Many rivulets and inundated channels were observed throughout the interior of the wetland. Uplands were filled areas significantly higher in elevation and therefore without primary or secondary indicators of hydrology. This wetland is identified on NWI and NYSDEC wetland maps, although it is not clearly visible on aerial imagery.



Wetland W1

This wetland is within a parcel located northwest of Father Capodanno Boulevard, and northeast of Seaview Avenue. It is behind an athletic field and a part of a greater tract of land that appears to be used for recreation, such as hiking and biking. Wetland W1 is an isolated wetland containing components of both palustrine scrub-shrub (PSS1E) and palustrine emergent (PEM1E) communities. The majority of this wetland extends north outside of the survey boundary, to the adjacent land. The shrub component is dominated by groundsel tree (*Baccharis halmifolia*) and various shrub willows (*Salix spp.*). The emergent component is dominated by switchgrass (*Panicum virgatum*), common reed, and purple loosestrife (*Lythrum salicaria*). The composition of hydrophytic plant species in this wetland exceeds 50% and therefore meets the USACE criterion for hydrophytic vegetation.

Field investigation revealed that the soil in wetland W1 consists of a 5-inch deep A horizon of very dark gray (10YR 3/1) loamy sand. This is underlain to a depth of greater than 15 inches by a dark brown (7.5YR 3/2) B horizon of sand with many distinct brown (7.5YR 4/4) mottles. Hydric soil indicators observed present evidence of reducing conditions and thereby meet USACE criteria for sandy wetland soils.

The primary indicator of hydrology in the wetland is soil saturation within the upper 12 inches of the soil profile. Standing water is also visible throughout much of the wetland. This wetland is identified on NWI and NYSDEC wetland maps.

Wetland E-1

Wetland E-1 is a large palustrine emergent (PEM5F) community with smaller associated PFO1E, PEM5E, and PUBH components. Several portions of Wetland E-1 have been impacted by past fill activities. The herbaceous layer is dominated by common reed and rough goldenrod (*Solidago patula*). The shrub/sapling layer was dominated by black willow (*Salix nigra*). The composition of hydrophytic plant species exceeds 50% and thereby meets the USACE criterion for wetland vegetation.

Field investigation revealed that the soil in Wetland E-1 consists of a 3-inch-deep, black (10YR 2/1), loamy sand A horizon. Below this horizon is a 3 to 8-inch-deep, very dark brown (10YR 2/2) loamy fine sand B₁ horizon with few distinct dark red (2.5YR 3/6) and many distinct strong brown (7.5YR 4/6) mottles. The B₂ horizon is a black (10YR 2/1) loamy sand, extending to a depth greater than 12 inches, with many distinct strong brown (7.5YR 4/6) and many distinct gray (10 YR 6/1) mottles. Hydric soil indicators observed indicate the presence of reducing conditions. Primary indicators of wetland hydrology include areas of inundation, saturation in the upper 12 inches, and watermarks. Secondary indicators of wetland hydrology include oxidized root channels in the upper 12 inches. Depth to free water in the soil pit was 8 inches. This wetland is clearly visible in aerial photographs and is identified on NWI and NYSDEC wetland maps.



4.0 SUMMARY

Wetland delineation surveys were conducted in 2003 and 2009 within an area corresponding to the areas being considered for proposed flood/storm damage reduction measures along the SSSI in the borough of Staten Island, City of New York, Richmond County, New York.

In 2003, a total of 18 wetlands were identified and delineated. Subsequently, additional areas were added to the project for consideration of proposed flood/storm damage reduction measures. Accordingly, in 2009, a supplemental wetland delineation survey was conducted to encompass these new areas and also to verify the wetlands previously delineated in 2003.

The boundaries of the 18 previously identified wetlands were verified or updated during the 2009 survey. In addition, 12 new wetlands were identified in the expanded survey area, and the borders of three (3) previously identified wetlands were extended and mapped beyond the previous survey limits. A total of 30 wetlands occur within the survey limits. The majority of these wetlands are well defined emergent wetlands dominated by common reed. A total of approximately 297.76 acres of wetlands were found to be present in the survey area. Table 2 presents the survey area location, classification, and size of each federal-jurisdictional wetland identified.



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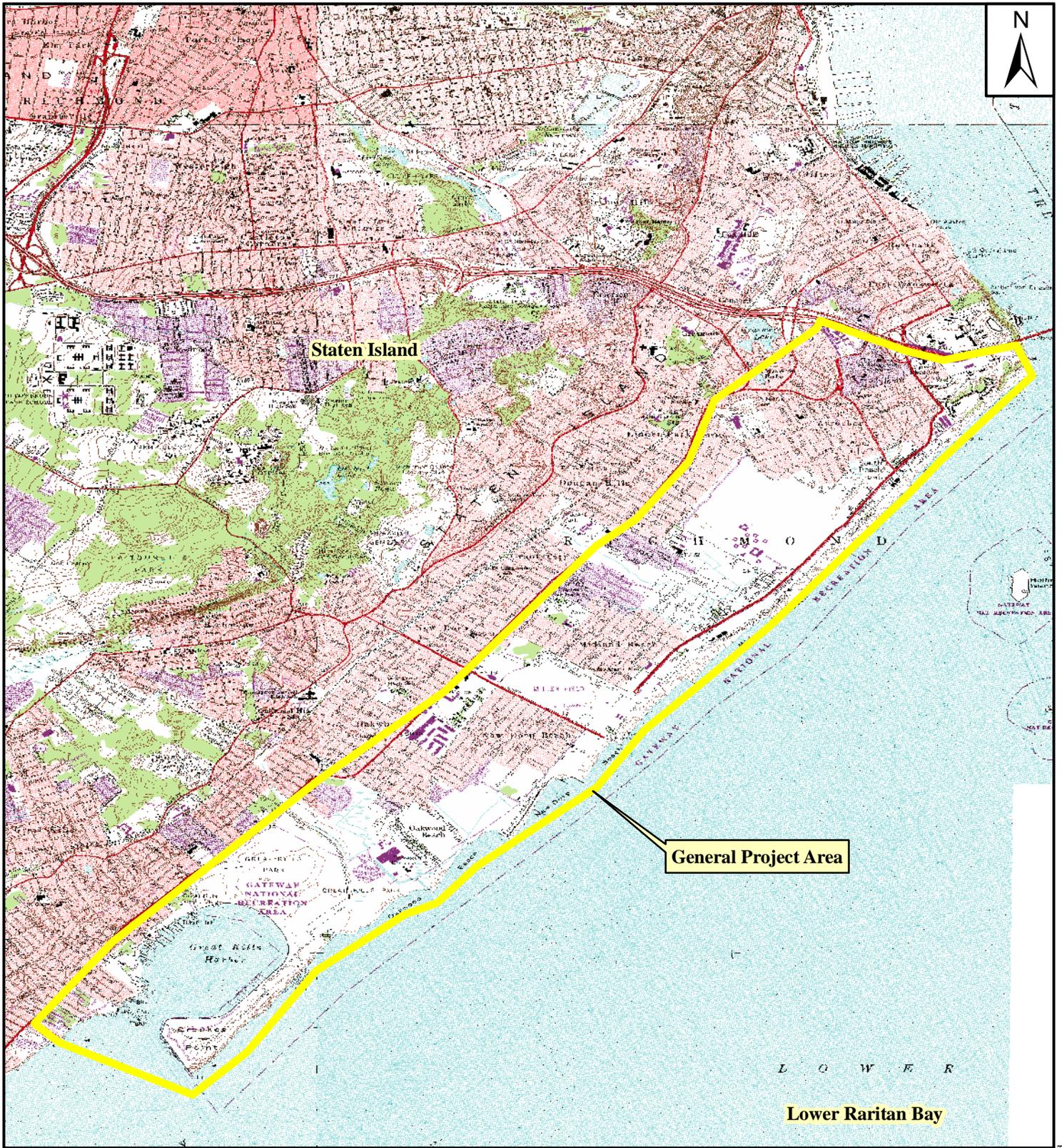


APPENDIX A

FIGURES

Figure 1

General Site Location Map



Project Location

Source: USGS 7.5' Series Topographic Quadrangle; The Narrows, NY-NJ and Arthur Kill, NY-NJ 1966, photorevised 1981.

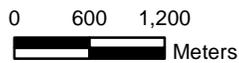


Figure 1. General Site Location Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For:



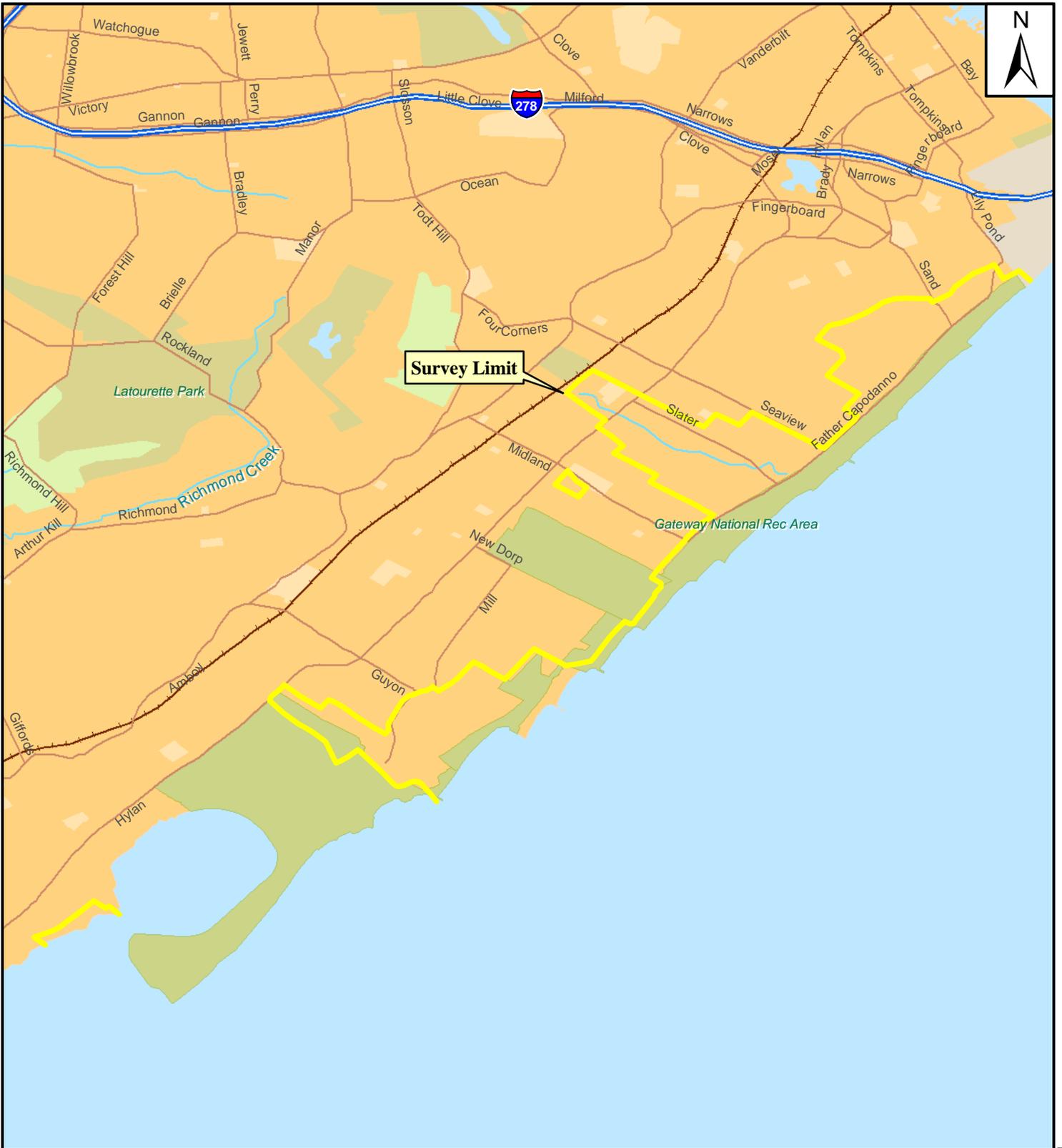
Prepared By:



Date:
8/09

Figure 2

Survey Area Limits



Legend

— Survey Limit

Source: ESRI Data 2008.

0 2,250 4,500
 Feet

0 550 1,100
 Meters

Figure 2. Survey Limits Location Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

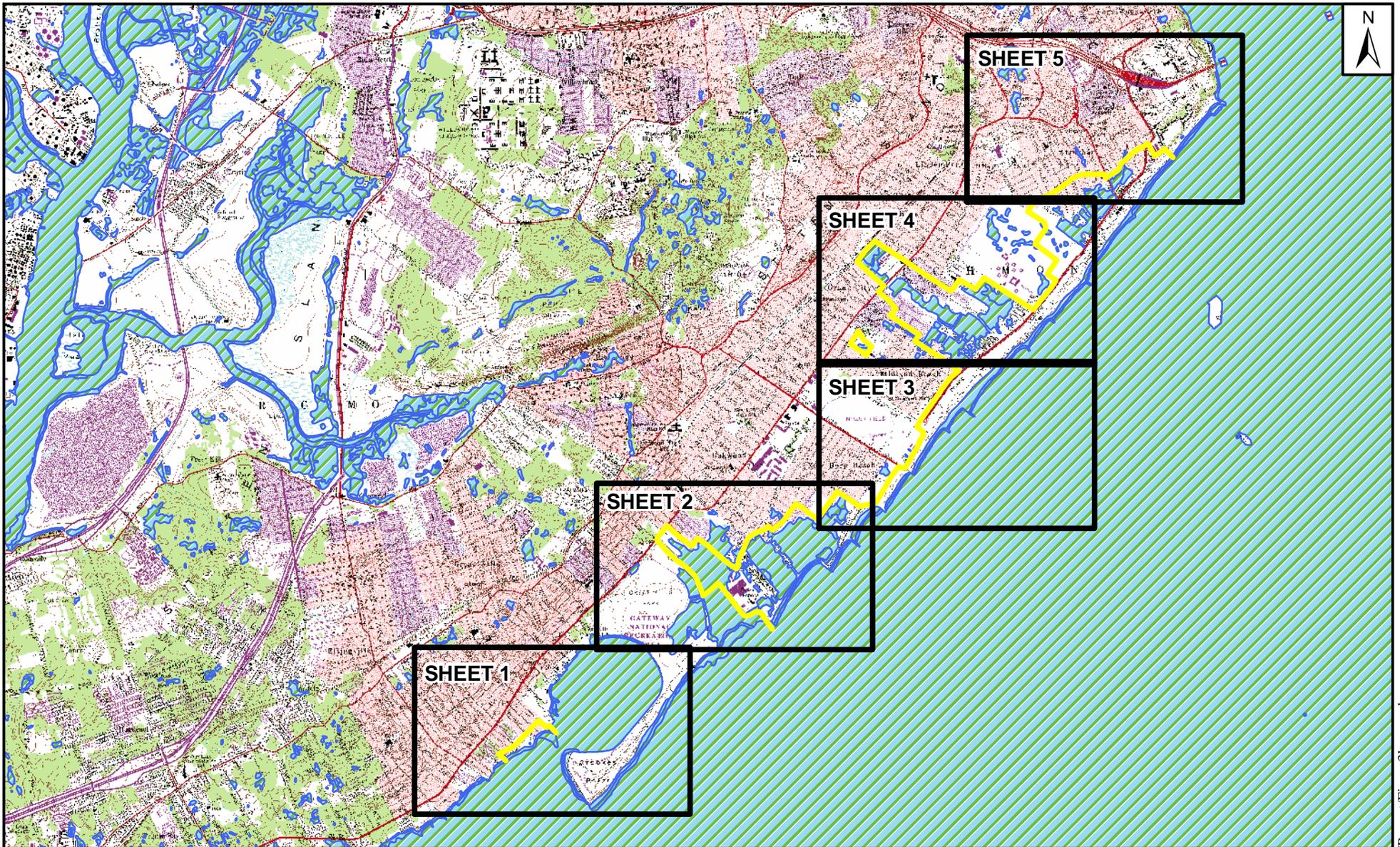
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 8/09

Figure 3 (Sheets 1–5)

National Wetland Inventory Maps



Legend

-  NWI Wetland
-  Sheet Boundary
-  Survey Limit

0 2,500 5,000
 Feet

0 600 1,200
 Meters

Source: USGS 7.5' Series Topographic Quadrangle; The Narrows, NY-NJ and Arthur Kill, NY-NJ 1966, photorevised 1981. USFWS-National Wetlands Inventory Data; The Narrows 1994 and Arthur Kill 1995.

Figure 3. NWI Sheet Boundary Key for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

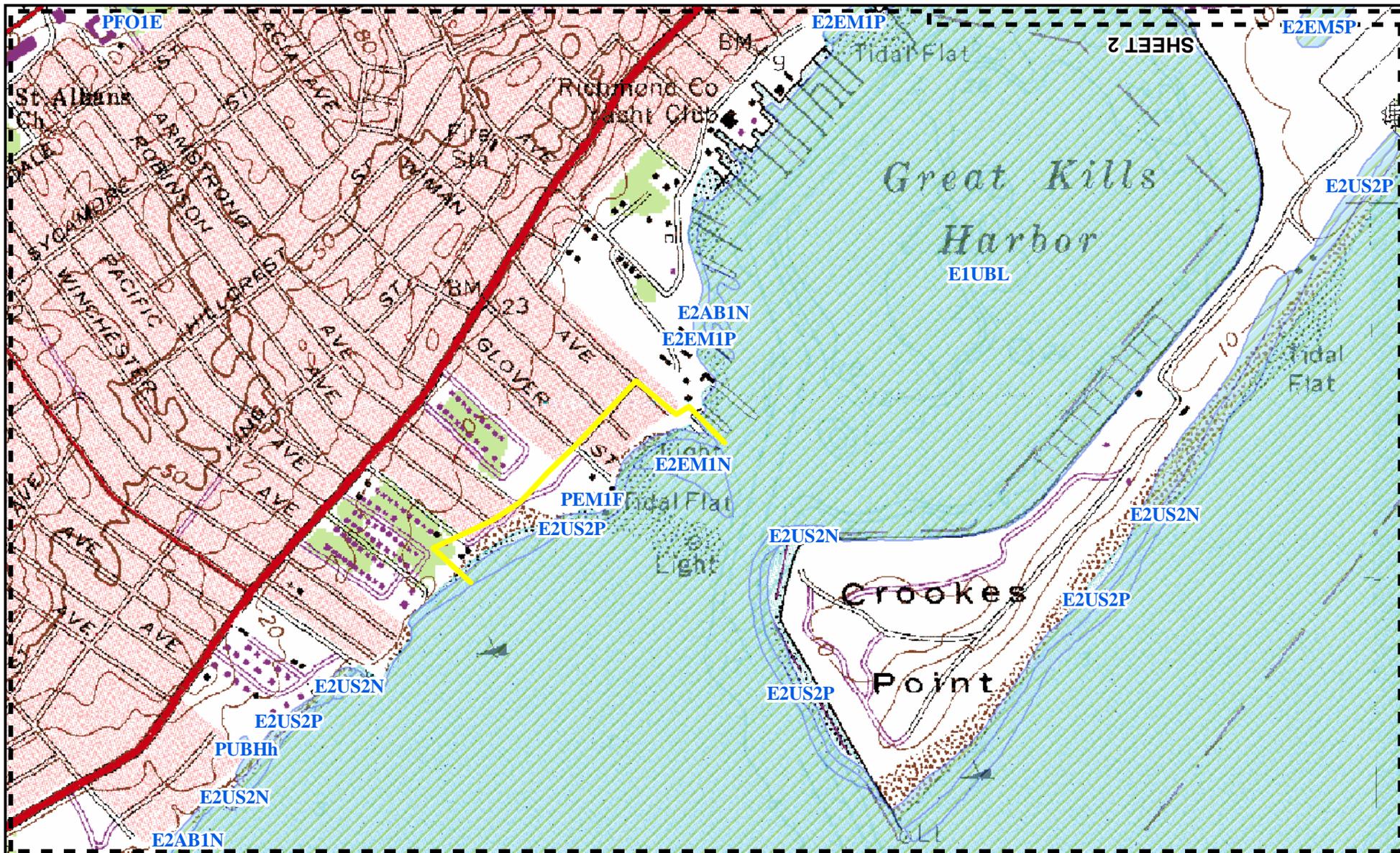
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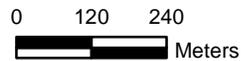
Date:
8/09



Legend

-  NWI Wetland
-  Sheet Boundary
-  Survey Limit

Source: USGS 7.5' Series Topographic Quadrangle; The Narrows, NY-NJ and Arthur Kill, NY-NJ 1966, photorevised 1981. USFWS-National Wetlands Inventory Data; The Narrows 1994 and Arthur Kill 1995.



SHEET 1

Figure 3. NWI Location Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

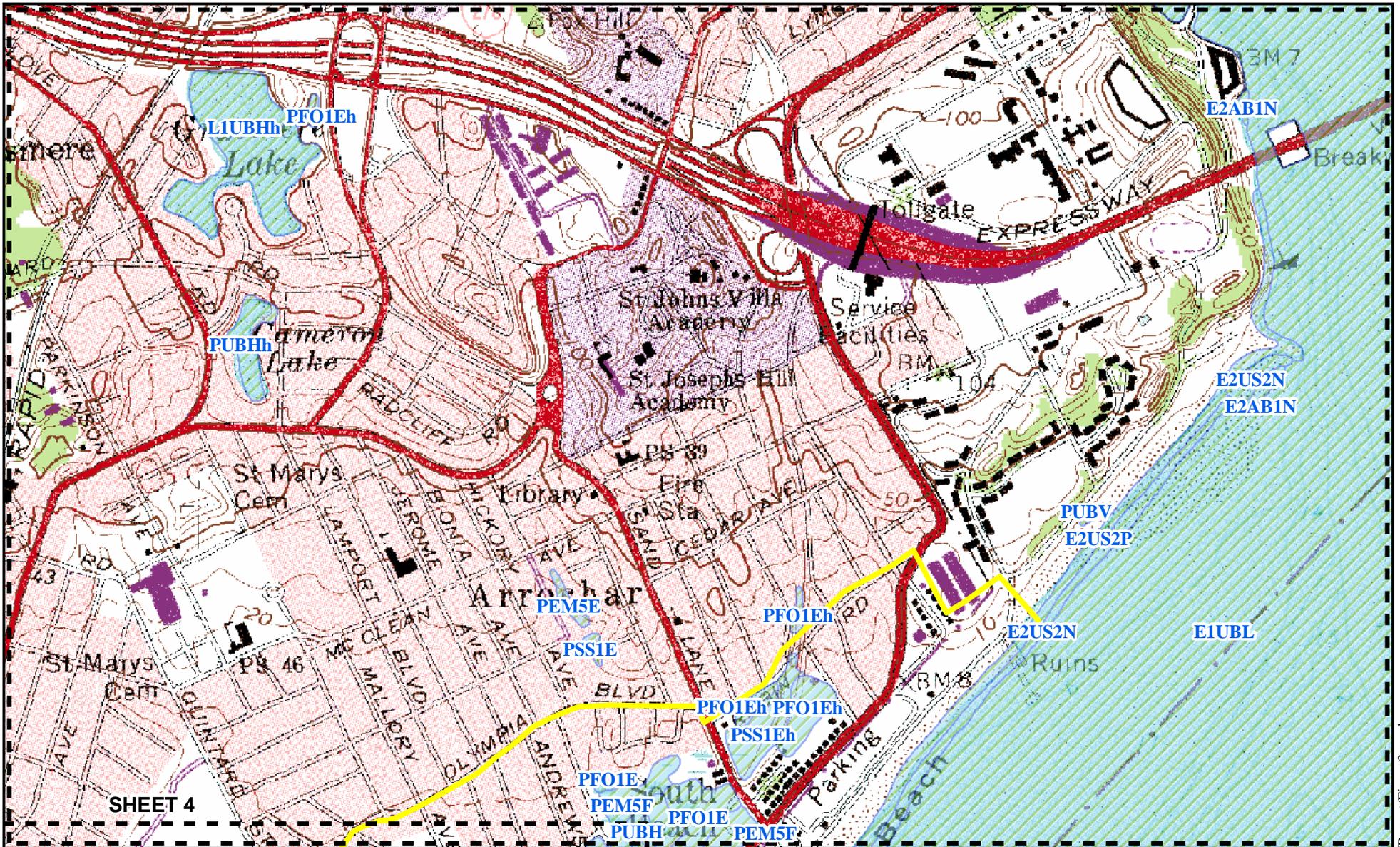
Prepared For:



Prepared By:



Date:
8/09



Legend

-  NWI Wetland
-  Sheet Boundary
-  Survey Limit

Source: USGS 7.5' Series Topographic Quadrangle; The Narrows, NY-NJ and Arthur Kill, NY-NJ 1966, photorevised 1981. USFWS-National Wetlands Inventory Data; The Narrows 1994 and Arthur Kill 1995.

0 500 1,000
 Feet

0 120 240
 Meters



SHEET 5

Figure 3. NWI Location Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For:



Prepared By:



Date:
8/09

Figure 4 (Sheets 1–3)

NY State DEC Freshwater Wetland Maps



Legend

-  NYSDEC Freshwater Wetland
-  Sheet Boundary
-  Survey Limit

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York.

0 2,000 4,000
 Feet

0 480 960
 Meters

Figure 4. NYSDEC Freshwater Wetlands Sheet Boundary Key for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For:



Prepared By:



Date:
8/09



Legend

-  NYSDEC Freshwater Wetland
-  Sheet Boundary
-  Survey Limit

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. NYSDEC-NY State Regulatory Freshwater Wetlands For Richmond County 1990.

0 500 1,000
 Feet

0 120 240
 Meters



SHEET 1

Figure 4. NYSDEC Freshwater Wetlands Location Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

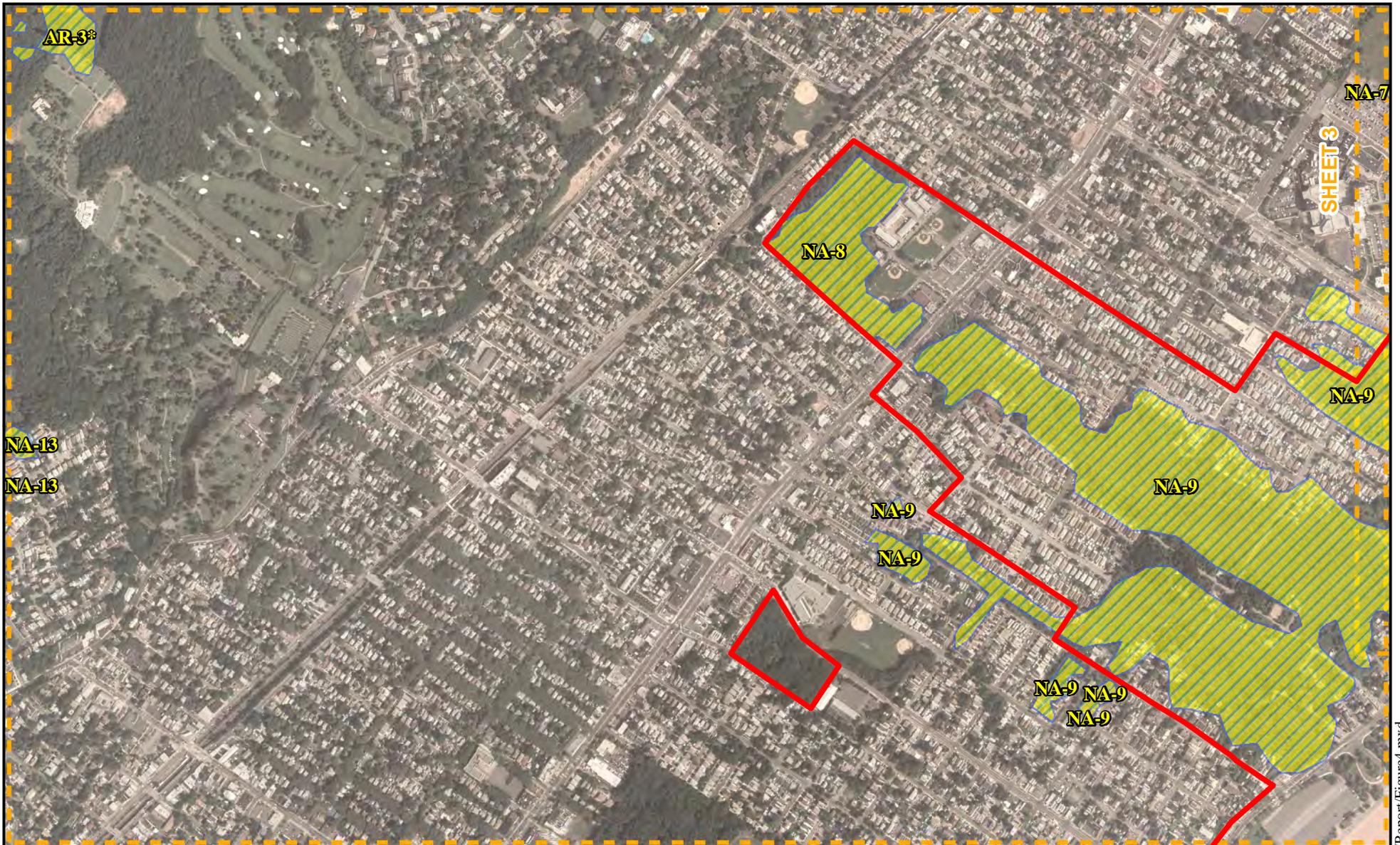
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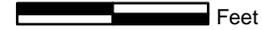


Date:
8/09



Legend

-  NYSDEC Freshwater Wetland
-  Sheet Boundary
-  Survey Limit

0 500 1,000
 Feet

0 120 240
 Meters



SHEET 2

Figure 4. NYSDEC Freshwater Wetlands Location Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For:



Prepared By:



Date:
8/09

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. NYSDEC-NY State Regulatory Freshwater Wetlands For Richmond County 1990.



SHEET 2

Legend

-  NYSDEC Freshwater Wetland
-  Sheet Boundary
-  Survey Limit

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. NYSDEC-NY State Regulatory Freshwater Wetlands For Richmond County 1990.

0 500 1,000
Feet

0 120 240
Meters



SHEET 3

Figure 4. NYSDEC Freshwater Wetlands Location Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For:



Prepared By:



Date:
8/09

Figure 5 (Sheets 1–13)
Delineated Wetland Resources



Legend

-  Sheet Boundaries
-  Survey Limit
-  Delineated Wetlands

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York.

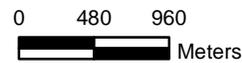


Figure 5. Delineated Wetlands Sheet Boundary Key for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared

For:



Prepared

By:



Date:

8/09



Legend

- Survey Limit
- Surveyed High Tide Line
- Surveyed Rocky Intertidal Zone
- Drainage Ditch
- ▨ Delineated Wetlands
- ▨ Clam Flat
- ▨ Sheet Boundaries

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.

SHEET 1

0 150 300

Feet

0 35 70

Meters

N

Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For:	<p>US Army Corps of Engineers®</p>	Date:
Prepared By:	<p>TETRA TECH</p>	8/09



Legend

- Survey Limit
- Surveyed High Tide Line
- Drainage Ditch
- ▤ Delineated Wetlands
- Sheet Boundaries

SHEET 2

0 150 300
 Feet

0 35 70
 Meters



Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For: US Army Corps of Engineers®

Prepared By: TETRA TECH

Date: 8/09

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.



Legend

-  Survey Limit
-  Surveyed High Tide Line
-  Drainage Ditch
-  Delineated Wetlands
-  Sheet Boundaries

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.

SHEET 3

0 150 300
 Feet

0 35 70
 Meters



Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For: 

Prepared By: 

Date: 8/09



Legend

- Survey Limit
- Surveyed High Tide Line
- Drainage Ditch
- ▧ Delineated Wetlands
- - - Sheet Boundaries

SHEET 4

0 150 300
 Feet

0 35 70
 Meters



Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For: 

Prepared By: 

Date: 8/09

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.



Legend

- Survey Limit
- Surveyed High Tide Line
- Drainage Ditch
- ▨ Delineated Wetlands
- - - Sheet Boundaries

SHEET 5

0 150 300
 Feet

0 35 70
 Meters



Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For: 

Prepared By: 

Date: 8/09

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.



SHEETS

SHEET 3

Legend

- Survey Limit
- Surveyed High Tide Line
- Drainage Ditch
- ▨ Delineated Wetlands
- - - Sheet Boundaries

SHEET 6

0 150 300
 Feet

0 35 70
 Meters



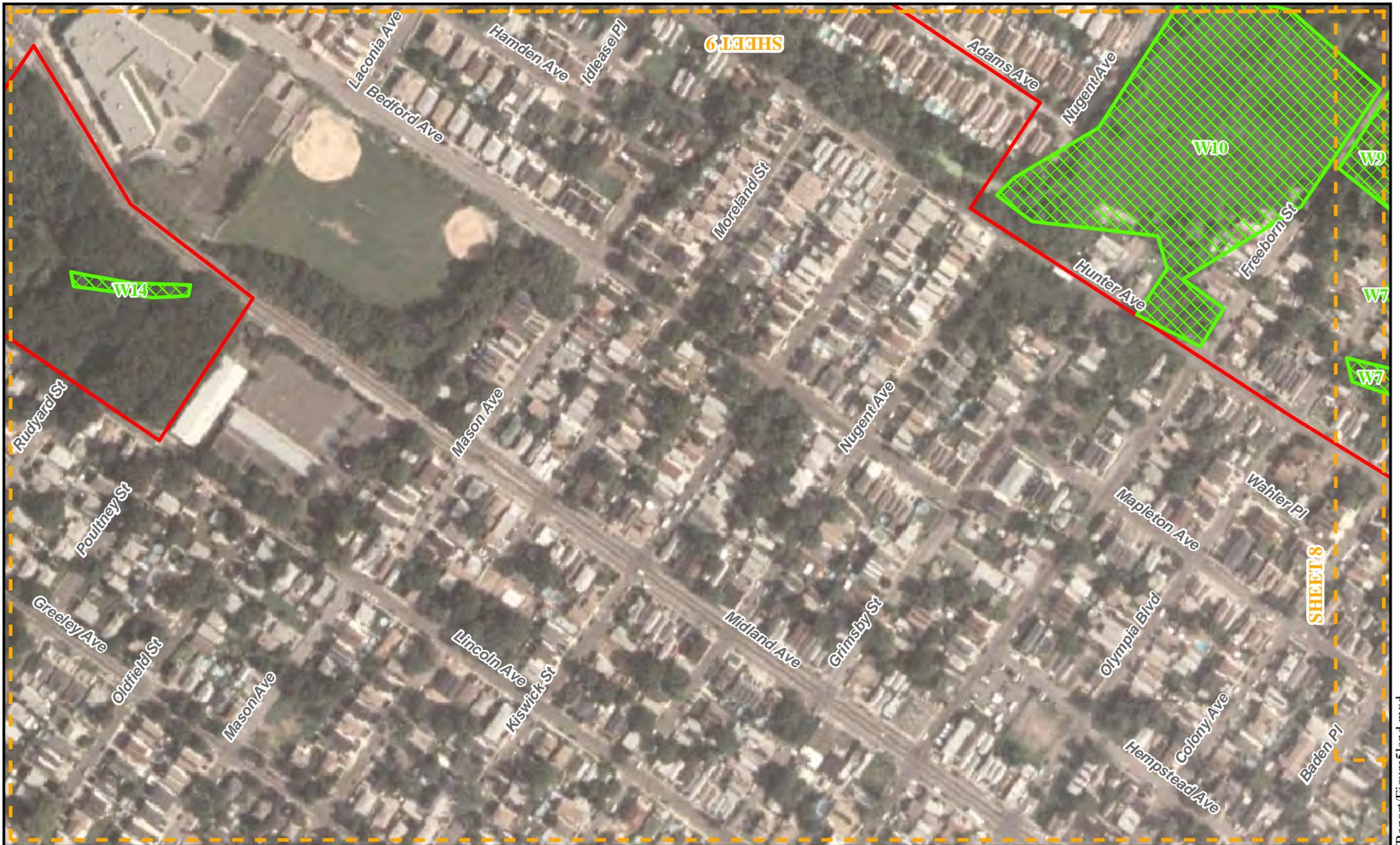
Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For:

Prepared By:

Date: **8/09**

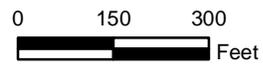
Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.



Legend

- Survey Limit
- Surveyed High Tide Line
- Drainage Ditch
- ▨ Delineated Wetlands
- - - Sheet Boundaries

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.



SHEET 7

Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For:



Prepared By:

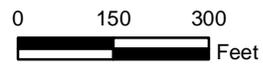


Date:
8/09



Legend

- Survey Limit
- Surveyed High Tide Line
- Drainage Ditch
- ▨ Delineated Wetlands
- Sheet Boundaries



SHEET 8

Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For:

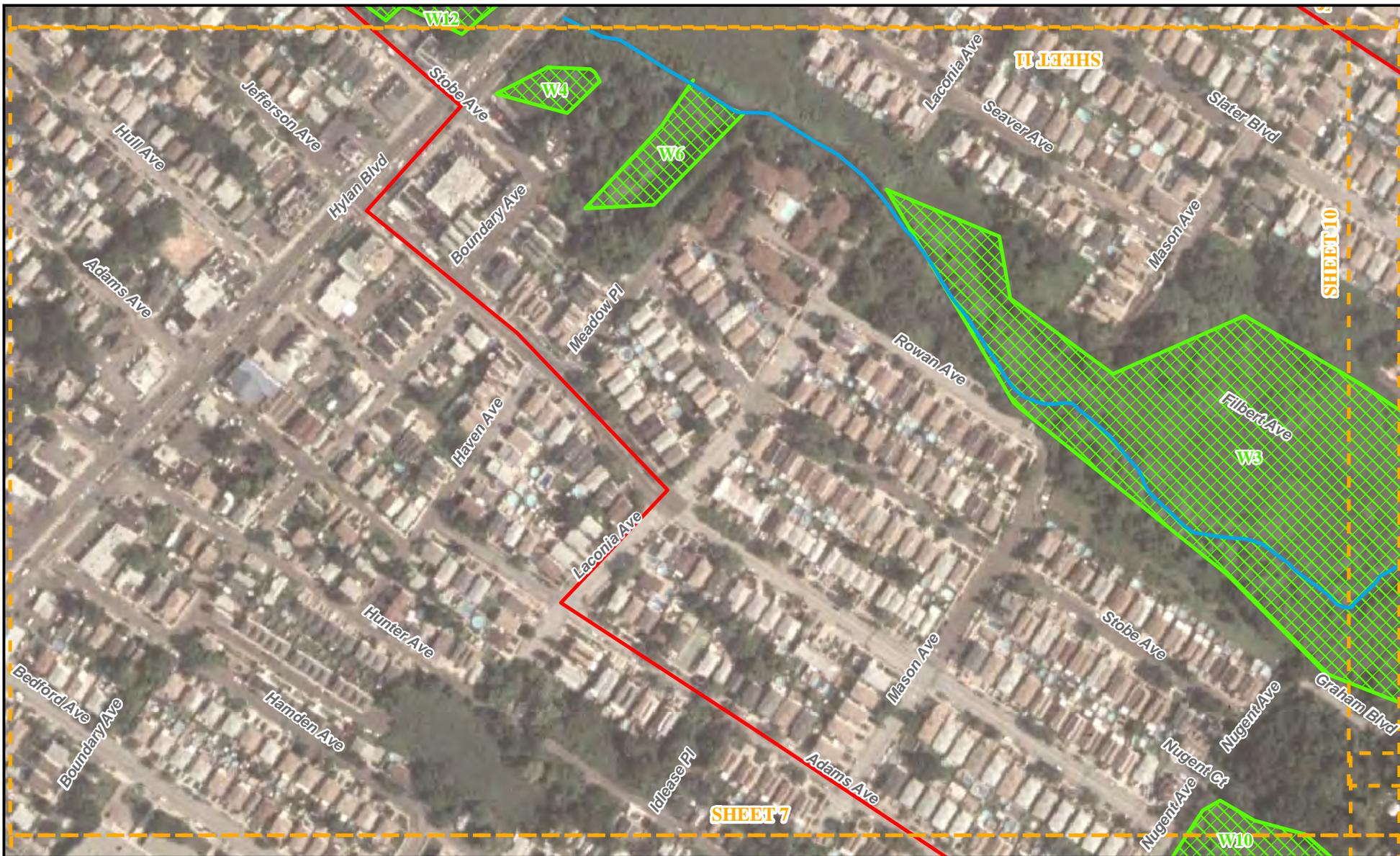


Prepared By:



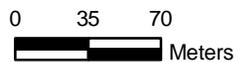
Date:
8/09

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.



Legend

- Survey Limit
- Surveyed High Tide Line
- Drainage Ditch
- ▨ Delineated Wetlands
- - - Sheet Boundaries



SHEET 9

Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For:



Prepared By:



Date:
8/09

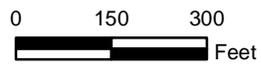
Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.



Legend

- Survey Limit
- Surveyed High Tide Line
- Drainage Ditch
- ▨ Delineated Wetlands
- Sheet Boundaries

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.



SHEET 10

Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

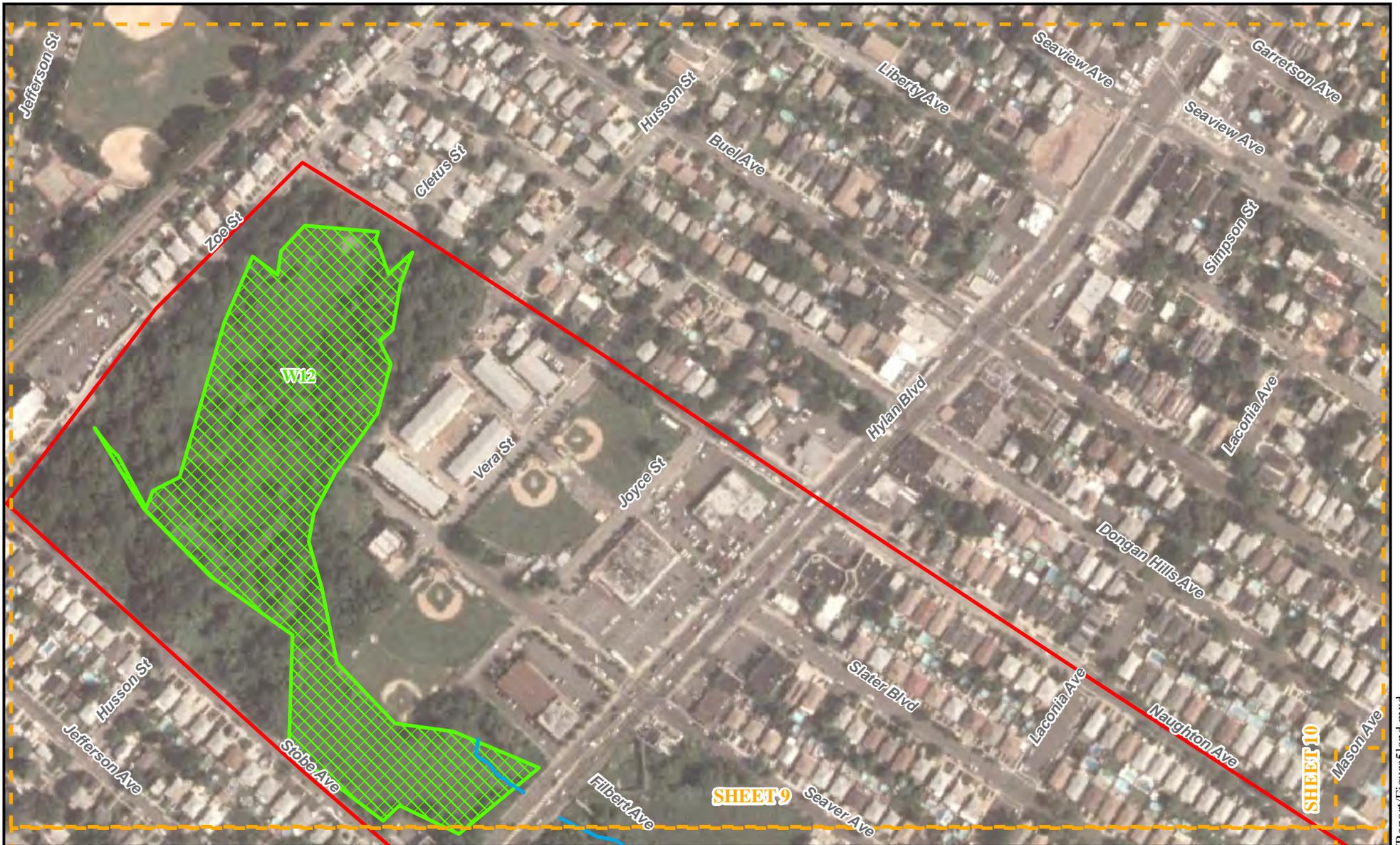
Prepared For:



Prepared By:



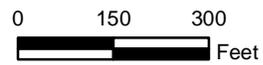
Date:
8/09



Legend

- Survey Limit
- Surveyed High Tide Line
- Drainage Ditch
- ▨ Delineated Wetlands
- - - Sheet Boundaries

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.



SHEET 11

Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For:



Prepared By:



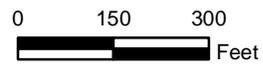
Date:
8/09



Legend

- Survey Limit
- Surveyed High Tide Line
- Drainage Ditch
- ▨ Delineated Wetlands
- - - Sheet Boundaries

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.



SHEET 12

Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

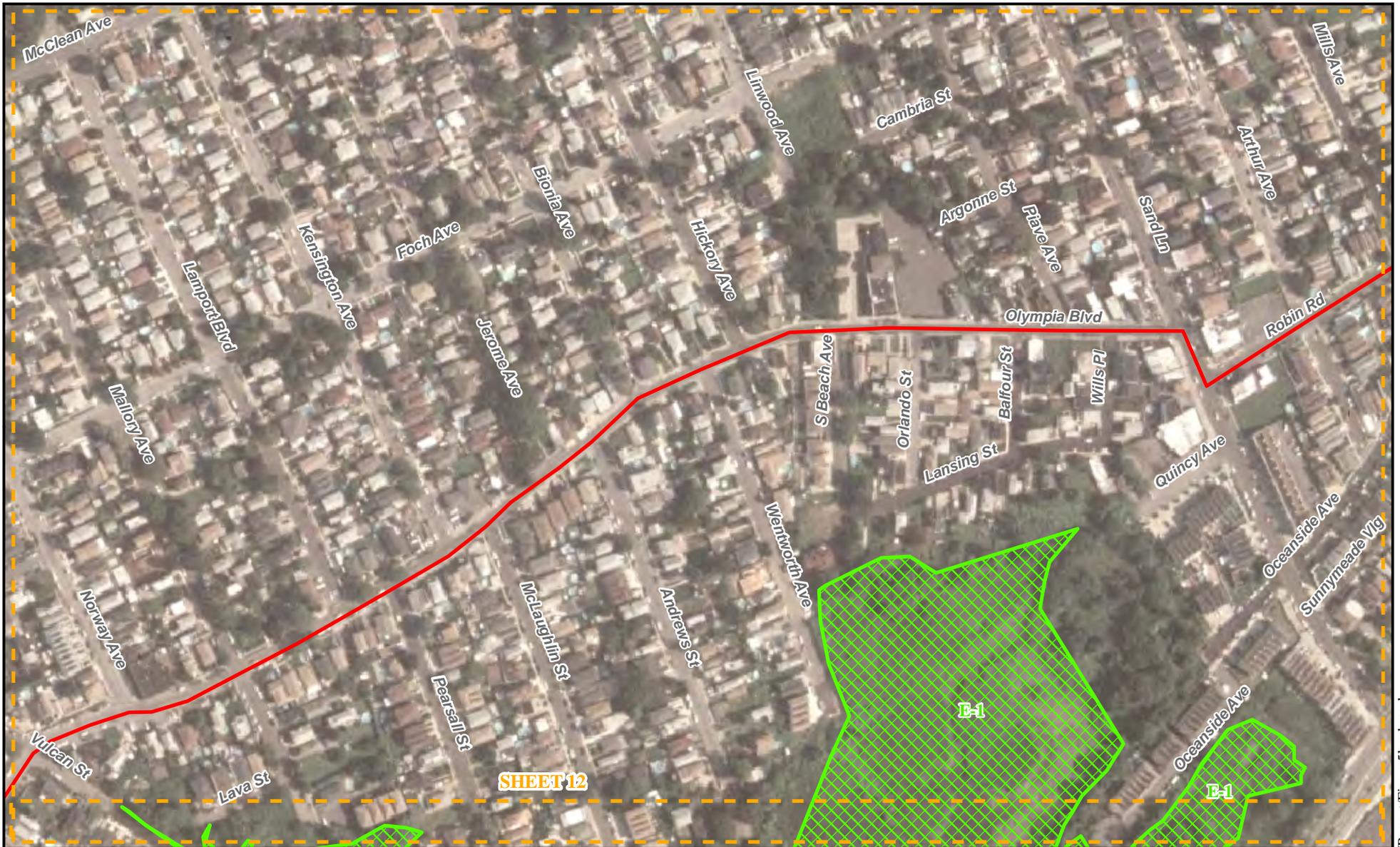
Prepared For:



Prepared By:



Date:
8/09



Legend

- Survey Limit
- Surveyed High Tide Line
- Drainage Ditch
- ▨ Delineated Wetlands
- - - Sheet Boundaries

Source: USDA/FSA - Aerial Photography Field Office; USDA-FSA-APFO NAIP MrSID Mosaic, for Richmond County, New York. Wetlands, Tetra Tech June 2009.

0 150 300
 Feet

0 35 70
 Meters

N

SHEET 13

Figure 5. Delineated Wetlands Map for South Shore of Staten Island Storm Damage Reduction Feasibility Study, Richmond County, New York.

Prepared For: US Army Corps of Engineers*

Prepared By: TETRA TECH

Date: 8/09

APPENDIX B

PHOTOGRAPHIC RECORD

- **Appendix B1: 2009 Survey Photo Log**
- **Appendix B2: 2003 Survey Photo Log**

Appendix B1

2009 Survey Photo Log

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetlands CB-1 and CB-2



Photographer: Lema
Date: 6/25/09
Photo No.: 1
Direction: West

Comments: Wetland CB1
– Verified in 2009



Photographer: Lema
Date: 6/29/09
Photo No.: 2
Direction: East

Comments: Wetland CB2
– Verified in 2009. This portion of the wetland extends into the adjacent forest. The common reed-dominated community is behind the photographer.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland A-1 / W11



Photographer: Lema
Date: 6/26/09
Photo No.: 3
Direction: East

Comments: Wetland A-1 /W11 – Upland development is visible in the background.



Photographer: Lema
Date: 6/26/09
Photo No.: 4
Direction: Southeast

Comments: Wetland A-1/ W11 – boundary verified in 2009. Picture shows a levee and tide gate on southeast portion of wetland.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetlands A-1 / W11 and A-2



Photographer: Lema
Date: 6/26/09
Photo No.: 5
Direction:

Comments: Wetland A-1 /W11 – verified and extended in 2009 to meet the coastline



Photographer: Lema
Date: 6/26/09
Photo No.: 6
Direction:

Comments: Wetland A-2 – verified in 2009, small isolated wetland.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetlands A-3 and A-4



Photographer: Lema

Date: 6/29/09

Photo No.: 7

Direction:

Comments: Wetland A-3 – verified in 2009. Separated from WA-1 by the road (lower right)



Photographer: Lema

Date: 6/29/09

Photo No.: 8

Direction:

Comments: Wetland A-4 – verified in 2009. Typical large common reed dominated emergent wetland.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland W13 / A5



Photographer: Lema
Date: 7/01/09
Photo No.: 9
Direction: Southeast

Comments: Wetland W13 /A5 – Extensive wetland continues to the trees visible on the horizon.



Photographer: Lema
Date: 7/02/09
Photo No.: 10
Direction: Northwest

Comments: Wetland W13 /A5 – The foreground appears to be an abandoned (upland) road into the wetland.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetlands W15 and W14



Photographer: Lema
Date: 7/02/09
Photo No.: 11
Direction: South

Comments: Wetland W15—
Foreground is filled and a
maintained residential lawn
community.



Photographer: Lema
Date: 7/01/09
Photo No.: 12
Direction: East

Comments: Wetland W14—
Entire area appears to be a
depository for fill, the
wetland is composed of
many swales and tire ruts.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetlands W7 and W8



Photographer: Lema
Date: 6/25/09
Photo No.: 13
Direction: Southeast

Comments: Wetland W7 – Upland areas surrounding wetland are composed solely of fill material.



Photographer: Lema
Date: 6/25/09
Photo No.: 14
Direction: South

Comments: Wetland W8 – Separated from W7 by Patterson Ave.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetlands W9 and W10



Photographer: Lema
Date: 6/25/09
Photo No.: 15
Direction: North

Comments: Wetland W9 – Separated from W7 by Olympia Blvd., and from W10 by Freeborn St.



Photographer: Lema
Date: 6/25/09
Photo No.: 16
Direction: Northeast

Comments: Wetland W10– Photo shows upland (filled) residential yard on the left.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetlands WC-1 and W5



Photographer: Lema
Date: 6/25/09
Photo No.: 17
Direction:

Comments: Stream running through the greater wetland, WC-1 – verified in 2009.



Photographer: Lema
Date: 6/24/09
Photo No.: 18
Direction: West

Comments: Wetland W5 – All areas surrounding this wetland are filled residential sites.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland W3



Photographer: Lema
Date: 6/24/09
Photo No.: 19
Direction: Southwest

Comments: Stream through Wetland W3. Note the extremely dense vegetation surrounding the stream.



Photographer: Lema
Date: 6/24/09
Photo No.: 20
Direction:

Comments: Wetland W3 – Trees in the background are the opposite edge of the wetland.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Area north of W3 and Wetland W4



Photographer: Lema
Date: 6/24/09
Photo No.: 21
Direction:

Comments: Common reed dominated area north of Wetland W3. This area was determined not to meet wetland criteria. Note mulch fill in foreground.



Photographer: Lema
Date: 6/24/09
Photo No.: 22
Direction: Northeast

Comments: Wetland W4– The wetland edge is composed of a dense mix of common reed and Japanese knotweed.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetlands W6 and W12



Photographer: Lema
Date: 6/24/09
Photo No.: 23
Direction: Northeast

Comments: Wetland W6 – adjacent to the baseball diamond (background)



Photographer: Lema
Date: 6/30/09
Photo No.: 24
Direction: Northwest

Comments: Wetland W12– Forested wetland flows into wetland W6, but delineated separately in the field.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetlands W2 and C-2



Photographer: Lema
Date: 6/23/09
Photo No.: 25
Direction: Southeast

Comments: Wetland W2 –
Wetland area is narrow
band of common reed in
the background.



Photographer: Lema
Date: 7/01/09
Photo No.: 26
Direction:

Comments: C-2 – verified
in 2009.

TETRA TECH, INC.

PHOTOGRAPHIC RECORD

Company: US Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetlands C-3 and W1



Photographer: Lema
Date: 6/27/09
Photo No.: 27
Direction: Southeast

Comments: Verification and continuation of wetland C-3. This wetland is well defined and includes the foreground.



Photographer: Lema
Date: 6/23/09
Photo No.: 28
Direction: North

Comments: Wetland W1. Note a combination of scrub/shrub and emergent wetland components.

Appendix B2

2003 Survey Photo Log

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland A1



Photographer: Garvey
Date: 10/02/03
Photo No.: 1
Direction: W

Comments: View (photo foreground) of Wetland A1 scrub-shrub fringe, which is located around many parts of the upland/wetland interface. Wetland A1 opens up into a large monotypic stand of common reed (visible in photo background).



Photographer: Garvey
Date: 10/02/03
Photo No.: 2
Direction: W

Comments: View of Wetland A1 as it borders the Sewage Treatment Facility at Oakwood Beach.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Levee and tide gate/Wetlands A1, A2, and A3



Photographer: Garvey
Date: 10/02/03
Photo No.: 3
Direction: WNW

Comments: View of the existing levee and tide gate at Oakwood Creek. Wetland A1 extends west from Hylan Boulevard and borders both sides of Oakwood Creek as it flows through the tide gate. Wetlands A2 and A3 are located on either side of the existing levee approximately 235 feet from the tide gate.



Photographer: Garvey
Date: 10/01/03
Photo No.: 4
Direction: SW

Comments: View of Wetland A2.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland A3/Wetland A4



Photographer: Garvey
Date: 10/01/03
Photo No.: 5
Direction: NW

Comments: View of Wetland A3, which is located in a depression on the opposite side of the levee and is dominated by common reed.



Photographer: Thompson
Date: 10/02/03
Photo No.: 6
Direction: NW

Comments: View over Wetland A4 from an existing levee.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland A5/Wetland C1



Photographer: Garvey
Date: 10/01/03
Photo No.: 7
Direction: N

Comments: View over Wetland A5. Note the residences clustered along the fringes of the wetland.



Photographer: Thompson
Date: 9/30/03
Photo No.: 8
Direction: NE

Comments: View of a portion of Wetland C1. Note the large monotypic stand of common reed and the residences clustered along the fringes of the wetland.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland C1/Wetland C2



Photographer: Thompson

Date: 9/30/03

Photo No.: 9

Direction: SE

Comments: View of a creek flowing through a portion of Wetland C1.



Photographer: Thompson

Date: 10/1/03

Photo No.: 10

Direction: NW

Comments: View of Wetland C2. This wetland is located in a small area that has been impacted by foreign fill and is adjacent to a residential area by Slater Avenue and Olympia Boulevard.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland C1 and C3



Photographer: Thompson
Date: 10/1/03
Photo No.: 11
Direction: SW

Comments:
Representative view of the *Phragmites*-dominated wetland habitat in Wetlands C1 and C3.



Photographer: Thompson
Date: 10/01/03
Photo No.: 12
Direction: SE

Comments: View of an emergent/forested component of Wetland C3 located on the north side of the wetland.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland C3



Photographer: Thompson
Date: 10/01/03
Photo No.: 13
Direction: NA

Comments: View of the upland/wetland interface of Wetland C3 where fill material extends down to the wetland.



Photographer: Thompson
Date: 10/01/03
Photo No.: 14
Direction: W

Comments: View of the western most point of Wetland C3. A large portion of the wetland has been excavated and fill material has been imported to assist in residential construction.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland C4/Wetland E1



Photographer: Thompson

Date: 10/3/01

Photo No.: 15

Direction: W

Comments: View of Wetland C4 where it borders Father Capodanno Boulevard.



Photographer: Garvey

Date: 9/29/03

Photo No.: 16

Direction: W

Comments: View of Wetland E1. Note the large monotypic stand of *Phragmites* surrounded by a fringe of scrub-shrub habitat.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland E1



Photographer: Garvey
Date: 9/30/03
Photo No.: 17
Direction: NA

Comments: View of a skateboard park built by local youth along the western boundary of Wetland E1.



Photographer: Garvey
Date: 9/30/03
Photo No.: 18
Direction: NA

Comments: View of a portion of Wetland E1 where forested and emergent wetland communities meet.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland CB1/Wetland CB2



Photographer: Fellion
Date: 10/24/03
Photo No.: 19
Direction: W

Comments: View of Wetland CB1 in the Crescent Beach survey area.



Photographer: Fellion
Date: 10/24/03
Photo No.: 20
Direction: NA

Comments: Typical view of wetland vegetation in Wetlands CB1 and CB2.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetland LM1



Photographer: Fellion
Date: 10/24/03
Photo No.: 21
Direction: W

Comments: View of Wetland LM1 beside the Armstrong Outfall.



Photographer: Fellion
Date: 10/24/03
Photo No.: 22
Direction: N

Comments: View of Wetland LM2 dominated by salt-marsh cord grass.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Wetlands LM3, LM4, LM5, and LM6



Photographer: Fellion
Date: 10/24/03
Photo No.: 23
Direction: NE

Comments: View of Wetland LM3. Note the rocky intertidal zone (RI-1) extends to the boundary of this wetland.



Photographer: Fellion
Date: 10/24/03
Photo No.: 24
Direction: SW

Comments: Wetlands LM4 and LM5 are located against the base of the seawall. Wetland LM6 is a very sparse population of salt-marsh cord grass growing in between the rip-rap associated with the old pilings visible in the photo.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Crescent Beach/Clam flat



Photographer: Thompson

Date: 10/3/03

Photo No.: 25

Direction: W

Comments: General view of the residential area located along the seawall at Crescent Beach and the clam flat (CF-1) area.



Photographer: Thompson

Date: 10/3/03

Photo No.: 26

Direction: N

Comments: General view of the residential area by the marina at Crescent Beach and the clam flat (CF-1) area.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Clam flat/Rocky intertidal zone



Photographer: Thompson

Date: 10/3/03

Photo No.: 27

Direction: NA

Comments: Close up view of the clam flat (CF-1) at Crescent Beach.



Photographer: Thompson

Date: 10/3/03

Photo No.: 28

Direction: S

Comments: View of the rocky intertidal zone (RI-1) at Crescent Beach.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Line of Protection-Boardwalk and Promenade



Photographer: Garvey
Date: 10/01/03
Photo No.: 29
Direction: N

Comments:
Representative view of the line of protection survey area along the boardwalk.



Photographer: Garvey
Date: 10/01/03
Photo No.: 30
Direction: N

Comments:
Representative view of the line of protection survey area along the promenade.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Line of Protection-Existing Buried Seawall



Photographer: Garvey
Date: 10/1/03
Photo No.: 31
Direction: N

Comments: Typical view along the existing buried seawall located adjacent to Wetlands A4 and W13/A5.



Photographer: Garvey
Date: 10/01/03
Photo No.: 32
Direction: NE

Comments: Typical view along the coastline near the existing buried seawall located adjacent to Wetland W13/A5.

NORTHERN ECOLOGICAL ASSOCIATES, INC.

PHOTOGRAPHIC RECORD

Company: United States Army Corps of Engineers
Project: South Shore of Staten Island
Feature: Drainage Area B/Drainage Area D



Photographer: Garvey
Date: 10/01/03
Photo No.: 33
Direction: NE

Comments: View of the bungalows along Cedar Grove Beach.

APPENDIX C
FIELD DATA FORMS

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>S. Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Frick</u>	Date: <u>06-23-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>PEM/BS</u> Transect ID: <u>w1</u> Plot ID: <u>wet 1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Baccharis helmitolia</u>	<u>S</u>	<u>FACW</u>	8. _____	_____	_____
3. <u>Salix sp. virginica</u>	<u>S</u>	<u>FACW (est)</u>	9. _____	_____	_____
4. <u>Panicum virgatum</u>	<u>H</u>	<u>FAC</u>	10. _____	_____	_____
5. <u>Rythrum salicaria</u>	<u>H</u>	<u>FACW</u>	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 5/ 100%

Remarks: Phragmites dominant in interson

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: <u>4</u> (in.) Depth to Saturated Soil: <u>0</u> (in.)	
Remarks: <u>Standing water throughout wetland</u>	

TETRA TECH ROUTINE WETLAND DETERMINATION - DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5	A	10YR3/1	—	—	Loamy Sand
5-15+	B	7.5YR3/2	7.5YR4/4	Many / Distinct	Sand
Hydric Soil Indicators:				Concretions	
<input type="checkbox"/> Histosol				<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils	
<input type="checkbox"/> Histic Epipedon				<input checked="" type="checkbox"/> Organic Streaking in Sandy Soils	
<input type="checkbox"/> Sulfidic Odor				<input type="checkbox"/> Listed on Local Hydric Soils List	
<input type="checkbox"/> Aquic Moisture Regime				<input type="checkbox"/> Listed on National Hydric Soils List	
<input type="checkbox"/> Reducing Conditions				<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Gleyed or Low-Chroma Colors					
Remarks: <u>Exposed sandy soil visible throughout - generally open</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)	(Circle)
Wetland Hydrology Present? Yes No	Is this Sampling Point Within a Wetland? Yes No
Hydric Soils Present? Yes No	
Sketch:	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N Finch</u>	Date: <u>06-23-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>UPSS</u> Transect ID: <u>W1</u> Plot ID: <u>UP-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Antennaria vulgaris</u>	<u>H</u>	<u>UPL</u>	7. _____	_____	_____
2. <u>Solidago canadensis</u>	<u>H</u>	<u>FACU</u>	8. _____	_____	_____
3. <u>Rhynchosis armeria</u>	<u>H</u>	<u>UPL</u>	9. _____	_____	_____
4. <u>Achillea millefolium</u>	<u>T</u>	<u>NI</u>	10. _____	_____	_____
5. <u>Asclepias syriaca</u>	<u>H</u>	<u>UPL</u>	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0/5

Remarks: Fails to meet criteria for wetland vegetation

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Remarks:

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-6</u>	<u>A</u>	<u>10YR3/2</u>	_____	_____	<u>Loamy sand</u>
<u>6-6+</u>	<u>B</u>	<u>7.5YR4/1</u>	_____	_____	<u>Loamy sand</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:	
<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: Very sandy- fails to meet hydric soil criteria

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle) Wetland Hydrology Present? Yes <u>No</u> Hydric Soils Present? Yes <u>No</u>	(Circle) Is this Sampling Point Within a Wetland? Yes <u>No</u>
Sketch:	

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>South Shore, Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Frick</u>	Date: <u>06-23-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>PEM</u> Transect ID: <u>W2</u> Plot ID: <u>Wet-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Impatiens capensis</u>	<u>H</u>	<u>FACW</u>	8. _____	_____	_____
3. _____	_____	_____	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 2/2 100%

Remarks:

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u> </u> (in.) Depth to Free Water in Pit: <u> 2 </u> (in.) Depth to Saturated Soil: <u> 0 </u> (in.)	Remarks:

TETRA TECH ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4	A	10YR2/1	—	—	Silt loam
4-9	B	2.5Y3/1	—	—	Sandy clay loam
9-18+	B	10YR3/1	—	—	Sand

Hydric Soil Indicators:	
_____ Histosol	_____ Concretions
_____ Histic Epipedon	_____ High Organic Content in Surface Layer in Sandy Soils
_____ Sulfidic Odor	_____ Organic Streaking in Sandy Soils
_____ Aquic Moisture Regime	_____ Listed on Local Hydric Soils List
_____ Reducing Conditions	_____ Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	_____ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes No (Circle)	(Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes No
Hydric Soils Present? <input checked="" type="radio"/> Yes No	

Sketch:

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Frich</u>	Date: <u>06-23-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? Yes <input checked="" type="radio"/> No (If needed, explain on reverse)	Community ID: <u>up herb</u> Transect ID: <u>W2</u> Plot ID: <u>UP-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Polygonum cuspidatum</u>	<u>H</u>	<u>FACW-</u>	7. _____	_____	_____
2. <u>Ailanthus altissima</u>	<u>T</u>	<u>NI</u>	8. _____	_____	_____
3. _____	_____	_____	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0/2

Remarks: Fails to meet criteria for hydrophytic vegetation

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12-inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: _____	

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>South Shore Staten Island</u>	Date: <u>06-24-09</u>
Applicant/Owner: <u>USACE</u>	County: <u>Richmond</u>
Investigator: <u>E. Lema, N. Finch</u>	State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: <u>PSS/PEM</u> Transect ID: <u>W3</u> Plot ID: <u>Wet-1</u>
Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Acer saccharinum</u>	<u>T</u>	<u>FACW</u>	8. _____	_____	_____
3. <u>Betula populifolia</u>	<u>T</u>	<u>FAC</u>	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 3/3 100%

Remarks: Nearly a monotypic stand of P. australis.

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input checked="" type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: <u>0</u> (in.)	Remarks: _____

TETRA TECH
ROUTINE WETLAND DETERMINATION - DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-1</u>	<u>O</u>				<u>Duff</u>
<u>1-4</u>	<u>A</u>	<u>10YR3/1</u>			<u>Clay loam</u>
<u>4-14+</u>	<u>B</u>	<u>2.5Y4/1</u>			<u>Clay loam</u>
Hydric Soil Indicators:					
_____	Histosol	_____	Concretions		
_____	Histic Epipedon	_____	High Organic Content in Surface Layer in Sandy Soils		
_____	Sulfidic Odor	_____	Organic Streaking in Sandy Soils		
_____	Aquic Moisture Regime	_____	Listed on Local Hydric Soils List		
_____	Reducing Conditions	_____	Listed on National Hydric Soils List		
<input checked="" type="checkbox"/>	Gleyed or Low-Chroma Colors	_____	Other (Explain in Remarks)		
Remarks: <u>10% coarse fragments</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes No (Circle)	(Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes No
Hydric Soils Present? <input checked="" type="radio"/> Yes No	
Sketch: <u>extension of wet on other side of dyke - Floodplain</u>	

**TETRA TECH
ROUTINE WETLAND DETERMINATION - DATA FORM**

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lora, N. F. Moh</u>	Date: <u>06-24-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (A typical Situation)? Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse)	Community ID: <u>Upharb</u> Transect ID: <u>W3</u> Plot ID: <u>Upl</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Antennaria vulgaris</u>	<u>H</u>	<u>UPL</u>	7. _____	_____	_____
2. _____	_____	_____	8. _____	_____	_____
3. _____	_____	_____	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0/1

Remarks: Fails to meet criteria for hydrophytic vegetation

HYDROLOGY

<p><input type="checkbox"/> Recorded Data (Describe in Remarks):</p> <p style="margin-left: 20px;"><input type="checkbox"/> Stream, Lake, or Tide Gauge</p> <p style="margin-left: 20px;"><input type="checkbox"/> Aerial Photographs</p> <p style="margin-left: 20px;"><input type="checkbox"/> Other</p> <p><input type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input type="checkbox"/> Inundated</p> <p><input type="checkbox"/> Saturated in Upper 12 inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input type="checkbox"/> Oxidized Root Channels in Upper 12 inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	
<p>Remarks: <u>Fails to meet criteria for wetland hydrology</u></p>	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>04</u>		<u>10YR3/2</u>	<u>—</u>	<u>—</u>	<u>Sandy loam</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Hydric Soil Indicators:					
_____ Histosol		_____ Concretions			
_____ Histic Epipedon		_____ High Organic Content in Surface Layer in Sandy Soils			
_____ Sulfidic Odor		_____ Organic Streaking in Sandy Soils			
_____ Aquic Moisture Regime		_____ Listed on Local Hydric Soils List			
_____ Reducing Conditions		_____ Listed on National Hydric Soils List			
_____ Gleyed or Low-Chroma Colors		_____ Other (Explain in Remarks)			
Remarks: <u>Auger refusal at 4" - area has been filled</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle) Wetland Hydrology Present? Yes <u>No</u> Hydric Soils Present? Yes <u>No</u>	(Circle) Is this Sampling Point Within a Wetland? Yes <u>No</u>
Sketch:	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lemay, N Finch</u>	Date: <u>06 24 09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>PEM</u> Transect ID: <u>W3</u> Plot ID: <u>Wet-2</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. _____	_____	_____	8. _____	_____	_____
3. _____	_____	_____	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 1/1 100%

Remarks: Monotypic stand of P. australis.

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: <u>6</u> (in.) Depth to Saturated Soil: <u>0</u> (in.)	Remarks: <u>Well defined boundary ~ 3' banks</u>

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lana, N. Fruch</u>	Date: <u>06-24-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse)	Community ID: <u>sp herb</u> Transect ID: <u>W3</u> Plot ID: <u>up-2</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Antennaria vulgaris</u>	<u>H</u>	<u>UPL</u>	7. _____		
2. _____			8. _____		
3. _____			9. _____		
4. _____			10. _____		
5. _____			11. _____		
6. _____			12. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0/1

Remarks: Filled area - nearly a monoculture of A. vulgaris

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Remarks: <u>Fails to meet criteria for wetland hydrology</u>

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____	
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No	
Profile Description:			
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)
0-5	A	10YR2/2	Sandy loam
Hydric Soil Indicators:			
	<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions
	<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
	<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils
	<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List
	<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List
	<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)
Remarks: <u>Auger refusal at 5" - Fails to meet criteria for hydric soils</u>			

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle)	(Circle)
Wetland Hydrology Present? Yes <u>No</u>	Is this Sampling Point Within a Wetland? Yes <u>No</u>
Hydric Soils Present? Yes <u>No</u>	
Sketch:	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finch</u>	Date: <u>06-24-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>PEM</u> Transect ID: <u>W4</u> Plot ID: <u>WET 1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Utrix vulpina</u>	<u>V</u>	<u>FAC</u>	8. _____	_____	_____
3. <u>Acer negundo</u>	<u>T</u>	<u>FAC+</u>	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 3/3 100%

Remarks: Meets criteria for hydrophytic vegetation

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>3</u> (in.) Depth to Free Water in Pit: <u>0</u> (in.) Depth to Saturated Soil: <u>0</u> (in.)	
Remarks: <u>obvious boundary</u>	

TETRA TECH ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-2</u>	<u>A</u>	<u>10YR3/1</u>	<u>—</u>	<u>—</u>	<u>Slt/1 loam</u>
<u>2-10</u>	<u>B</u>	<u>10YR2/1</u>	<u>—</u>	<u>—</u>	<u>Silt, clay loam</u>
<u>10-18+</u>	<u>B</u>	<u>2.5Y4/3</u>	<u>—</u>	<u>—</u>	<u>sand</u>
Hydric Soil Indicators:					
_____ Histosol		_____ Concretions		_____ High Organic Content in Surface Layer in Sandy Soils	
_____ Histic Epipedon		_____ Organic Streaking in Sandy Soils		_____ Listed on Local Hydric Soils List	
_____ Sulfidic Odor		_____ Listed on National Hydric Soils List		_____ Other (Explain in Remarks)	
_____ Aquic Moisture Regime					
_____ Reducing Conditions					
_____ Gleyed or Low-Chroma Colors					
Remarks:					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes No (Circle) Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes No Hydric Soils Present? <input checked="" type="checkbox"/> Yes No	(Circle) Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes No
Sketch: 	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finch</u>	Date: <u>06-24-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input checked="" type="radio"/> No <input type="radio"/> Is the area a potential Problem Area? Yes <input checked="" type="radio"/> No <input type="radio"/> (If needed, explain on reverse)	Community ID: <u>up town</u> Transect ID: <u>24</u> Plot ID: <u>up 1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Acer negundo</u>	<u>T</u>	<u>FAC</u>	7. <u>Parthenocissus quinquefolia</u>	<u>V</u>	<u>FAC</u>
2. <u>Acer platanoides</u>	<u>T</u>	<u>UPL</u>	8. _____	_____	_____
3. <u>Alliaria petiolata</u>	<u>H</u>	<u>UPL</u>	9. _____	_____	_____
4. <u>Lonicera japonica</u>	<u>S</u>	<u>FAC-</u>	10. _____	_____	_____
5. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	11. _____	_____	_____
6. <u>Pennis setosa</u>	<u>T</u>	<u>FAC</u>	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 17 14%

Remarks: Heavily invaded system - fails to meet criteria for wetland vegetation

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Remarks: <u>Fails to meet criteria for wetland hydrology</u>

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-7.</u>	<u>A</u>	<u>10YR 2/1</u>	<u>—</u>	<u>—</u>	<u>loam</u>
<u>7-18+</u>	<u>B₁</u>	<u>10YR 3/3</u>	<u>—</u>	<u>—</u>	<u>sand</u>
	<u>B₂</u>	<u>7.5YR 3/4</u>	<u>✓</u>	<u>—</u>	<u>sand</u>
Hydric Soil Indicators:					
<input type="checkbox"/>	Histosol	<input type="checkbox"/>	Concretions		
<input type="checkbox"/>	Histic Epipedon	<input type="checkbox"/>	High Organic Content in Surface Layer in Sandy Soils		
<input type="checkbox"/>	Sulfidic Odor	<input type="checkbox"/>	Organic Streaking in Sandy Soils		
<input type="checkbox"/>	Aquic Moisture Regime	<input type="checkbox"/>	Listed on Local Hydric Soils List		
<input type="checkbox"/>	Reducing Conditions	<input type="checkbox"/>	Listed on National Hydric Soils List		
<input type="checkbox"/>	Gleyed or Low-Chroma Colors	<input type="checkbox"/>	Other (Explain in Remarks)		
Remarks: <u>Fails to meet criteria for hydric soils</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle) Wetland Hydrology Present? Yes <u>No</u> Hydric Soils Present? Yes <u>No</u>	(Circle) Is this Sampling Point Within a Wetland? Yes <u>No</u>
Sketch:	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finch</u>	Date: <u>06-24-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input checked="" type="radio"/> No <input type="radio"/> (If needed, explain on reverse)	Community ID: <u>DEM</u> Transect ID: <u>W5</u> Plot ID: <u>wet-1</u>

VEGETATION

Dominant Plant Species Stratum Indicator	Dominant Plant Species Stratum Indicator
1. <u>Phragmites australis</u> H FACW	7. _____
2. _____	8. _____
3. _____	9. _____
4. _____	10. _____
5. _____	11. _____
6. _____	12. _____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 1/1 100%

Remarks: Monotypic stand of P. australis

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>3</u> (in.) Depth to Free Water in Pit: <u>0</u> (in.) Depth to Saturated Soil: <u>0</u> (in.)	Remarks: <u>Standing water throughout</u>

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finch</u>	Date: <u>06-24-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>up herb</u> Transect ID: <u>W5</u> Plot ID: <u>W5-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Poa pratensis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Morus alba</u>	<u>T</u>	<u>UPL</u>	8. _____	_____	_____
3. <u>Taraxacum officinale</u>	<u>H</u>	<u>FACW-</u>	9. _____	_____	_____
4. <u>Plantago major</u>	<u>H</u>	<u>FACW</u>	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0%

Remarks: Herbaceous lawn species - fails to meet hydrophytic criteria

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: <u>Fails to meet criteria for wetland hydrology</u>	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lamm, J. Thayer</u>	Date: <u>06-24-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse)	Community ID: <u>PEM</u> Transect ID: <u>W6</u> Plot ID: <u>Wet1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Impatiens capensis</u>	<u>H</u>	<u>FACW</u>	8. _____	_____	_____
3. <u>Acer Negundo</u>	<u>T</u>	<u>FAC+</u>	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 3/3 100%

Remarks: 90% P. australis

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks):</p> <p style="padding-left: 20px;">___ Stream, Lake, or Tide Gauge</p> <p style="padding-left: 20px;">___ Aerial Photographs</p> <p style="padding-left: 20px;">___ Other</p> <p>___ No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p style="padding-left: 20px;"><input checked="" type="checkbox"/> Inundated</p> <p style="padding-left: 20px;"><input checked="" type="checkbox"/> Saturated in Upper 12 inches</p> <p style="padding-left: 20px;">___ Water Marks</p> <p style="padding-left: 20px;">___ Drift Lines</p> <p style="padding-left: 20px;">___ Sediment Deposits</p> <p style="padding-left: 20px;">___ Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p style="padding-left: 20px;">___ Oxidized Root Channels in Upper 12 inches</p> <p style="padding-left: 20px;">___ Water-Stained Leaves</p> <p style="padding-left: 20px;">___ Local Soil Survey Data</p> <p style="padding-left: 20px;">___ FAC-Neutral Test</p> <p style="padding-left: 20px;">___ Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: <u>3</u> (in.)</p> <p>Depth to Free Water in Pit: <u>0</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	<p>Remarks: <u>Standing water visible throughout wetland</u></p>

TETRA TECH ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): _____		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3	O	10YR 2/1	—	—	Organic
3-6	A	10YR 3/1	—	—	Silt loam
6-12	B	10YR 2/1	—	—	Sandy loam
Hydric Soil Indicators:					
	<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions		
	<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils		
	<input checked="" type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils		
	<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List		
	<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List		
	<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)		
Remarks: Auger refusal at 12"					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes No (Circle)	(Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes No
Hydric Soils Present? <input checked="" type="radio"/> Yes No	
Sketch:	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore of Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Fitch</u>	Date: <u>06-24-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>v For</u> Transect ID: <u>W6</u> Plot ID: <u>v p 1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Robinia pseudoacacia</u>	<u>T</u>	<u>FACW-</u>	7. _____	_____	_____
2. <u>Acer negundo</u>	<u>T</u>	<u>FAC+</u>	8. _____	_____	_____
3. <u>Polygonum cuspidatum</u>	<u>H</u>	<u>FACW-</u>	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): vs 33%

Remarks: Fails to meet criteria for wetland vegetation

HYDROLOGY

 Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available 	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Remarks: <u>Fails to meet criteria for wetland hydrology</u>

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-9</u>	<u>A</u>	<u>10YR2/2</u>	<u>—</u>	<u>—</u>	<u>Sandy loam</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Hydric Soil Indicators:					
_____ Histosol		_____ Concretions			
_____ Histic Epipedon		_____ High Organic Content in Surface Layer in Sandy Soils			
_____ Sulfidic Odor		_____ Organic Streaking in Sandy Soils			
_____ Aquic Moisture Regime		_____ Listed on Local Hydric Soils List			
_____ Reducing Conditions		_____ Listed on National Hydric Soils List			
_____ Gleyed or Low-Chroma Colors		_____ Other (Explain in Remarks)			
Remarks: <u>Auger refusal at 9" - fails to meet criteria for hydric soils.</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle) Wetland Hydrology Present? Yes <u>No</u> Hydric Soils Present? Yes <u>No</u>	(Circle) Is this Sampling Point Within a Wetland? Yes <u>No</u>
Sketch:	

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>South Shore, Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lemay, N. Finch</u>	Date: <u>06-25-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>PEM</u> Transect ID: <u>W7</u> Plot ID: <u>wet-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Impatiens capensis</u>	<u>H</u>	<u>FACW</u>	8. _____	_____	_____
3. <u>Vitis vulpina</u>	<u>V</u>	<u>FAC</u>	9. _____	_____	_____
4. <u>Aralia sp. moser</u>	<u>S</u>	<u>FAC</u>	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 4/4 100%

Remarks: Vegetation nearly a monotypic stand of Phragmites

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: <u>0</u> (in.)	Remarks:

TETRA TECH ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-3</u>	<u>A</u>	<u>10YR2/1</u>	<u>-</u>	<u>-</u>	<u>Sandy clay loam</u>
<u>3-10</u>	<u>B</u>	<u>10YR3/2</u>	<u>7.5YR4/6</u>	<u>Many / prominent</u>	<u>Sandy clay loam</u>
<u>10+</u>	<u>refusal</u>	_____	_____	_____	<u>coarse fragments</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Hydric Soil Indicators:					
_____	_____ Histosol	_____	_____ Concretions		
_____	_____ Histic Epipedon	_____	_____ High Organic Content in Surface Layer in Sandy Soils		
_____	_____ Sulfidic Odor	_____	_____ Organic Streaking in Sandy Soils		
_____	_____ Aquic Moisture Regime	_____	_____ Listed on Local Hydric Soils List		
_____	_____ Reducing Conditions	_____	_____ Listed on National Hydric Soils List		
_____	_____ Gleyed or Low-Chroma Colors	_____	_____ Other (Explain in Remarks)		
Remarks: <u>Soil likely disturbed in part by road construction and hydrant installation.</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	(Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Sketch:	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finch</u>	Date: <u>06-25-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>Up Forest</u> Transect ID: <u>10/7</u> Plot ID: <u>UP-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Populus grandidentata</u>	<u>T</u>	<u>FACU-</u>	7. <u>Alliaria petiolata</u>	<u>H</u>	<u>UPL</u>
2. <u>Lonicera japonica</u>	<u>S</u>	<u>FAC-</u>	8. _____	_____	_____
3. <u>Rosa multiflora</u>	<u>S</u>	<u>FACU</u>	9. _____	_____	_____
4. <u>Prunus serotina</u>	<u>S</u>	<u>FACU</u>	10. _____	_____	_____
5. <u>Convolvulus arvensis</u>	<u>H</u>	<u>UPL</u>	11. _____	_____	_____
6. <u>Aralia spmosen</u>	<u>S</u>	<u>FAC</u>	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): NA 14%

Remarks: Understory dominated by invasives

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: <u>No hydrology indicators present</u>	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-8</u>	<u>A</u>	<u>7.5YR3/3</u>	<u>—</u>	<u>—</u>	<u>Sandy Loam</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Hydric Soil Indicators:					
_____ Histosol		_____ Concretions			
_____ Histic Epipedon		_____ High Organic Content in Surface Layer in Sandy Soils			
_____ Sulfidic Odor		_____ Organic Streaking in Sandy Soils			
_____ Aquic Moisture Regime		_____ Listed on Local Hydric Soils List			
_____ Reducing Conditions		_____ Listed on National Hydric Soils List			
_____ Gleyed or Low-Chroma Colors		_____ Other (Explain in Remarks)			
Remarks: <u>Fails to meet minimum criteria for hydric soils</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle)	(Circle)
Wetland Hydrology Present? Yes <u>No</u>	Is this Sampling Point Within a Wetland? Yes <u>No</u>
Hydric Soils Present? Yes <u>No</u>	
Sketch:	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore / Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finch</u>	Date: <u>06-25-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>PEM</u> Transect ID: <u>W8</u> Plot ID: <u>WCT1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Toxicodendron radicans</u>	<u>✓</u>	<u>FAC</u>	8. _____	_____	_____
3. _____	_____	_____	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 1/2 100%

Remarks: Extremely dense thicket of Phragmites and poison ivy

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: <u>4</u> (in.)	Remarks: <u>Slightly drier than surrounding areas</u>

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>South Shore Station Island</u>	Date: <u>08-25-09</u>
Applicant/Owner: <u>USACE</u>	County: <u>Richmond</u>
Investigator: <u>E. Lema, N. Finch</u>	State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: <u>PEM/PS5</u>
Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/>	Transect ID: <u>W9</u>
Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Plot ID: <u>Wet 1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Vitis vulpina</u>	<u>V</u>	<u>FAC</u>	8. _____	_____	_____
3. <u>Lonicera bonzonii</u>	<u>S</u>	<u>FACW</u>	9. _____	_____	_____
4. <u>Toxicodendron radicans</u>	<u>V</u>	<u>FAC</u>	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 4/4 100%

Remarks: Phragmites monoculture in interior, shrubs on western edge

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><input type="checkbox"/> Stream, Lake, or Tide-Gauge</p> <p><input type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input type="checkbox"/> Saturated in Upper 12 inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input checked="" type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input type="checkbox"/> Oxidized Root Channels in Upper 12 inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: <u>1</u> (in.)</p> <p>Depth to Free Water in Pit: <u>0</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	
<p>Remarks: <u>Wetland inundated < 3' from pavement</u></p>	

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>South Shore Staten Island</u>	Date: <u>06-25-09</u>
Applicant/Owner: <u>USACE</u>	County: <u>Richmond</u>
Investigator: <u>E. Lema, N. Finch</u>	State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: <u>UPSS</u>
Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/>	Transect ID: <u>W9</u>
Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Plot ID: <u>UP-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Morus rubra</u>	<u>T</u>	<u>FACU</u>	7. <u>Poa sp.</u>	<u>H</u>	<u>?</u>
2. <u>Rosa multiflora</u>	<u>S</u>	<u>FACU</u>	8. _____	_____	_____
3. <u>Lonicera japonica</u>	<u>S</u>	<u>FAC-</u>	9. _____	_____	_____
4. <u>Convolvulus arvensis</u>	<u>H</u>	<u>UPL</u>	10. _____	_____	_____
5. <u>Artemisia vulgaris</u>	<u>H</u>	<u>UPL</u>	11. _____	_____	_____
6. <u>Polygonum cuspidatum</u>	<u>H</u>	<u>FACU-</u>	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0%

Remarks: Old field species, very dense.

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: <u>Fails to meet criteria for wetland hydrology.</u>	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-2</u>	<u>A</u>	<u>10YR3/3</u>	<u>-</u>	<u>-</u>	<u>Sand loam</u>
<u>2-5</u>	<u>B</u>	<u>10YR3/6</u>	<u>-</u>	<u>-</u>	<u>Sand loam</u>
<u>5-9</u>	<u>B</u>	<u>10YR2/2</u>	<u>-</u>	<u>-</u>	<u>Sandy clay loam</u>
Hydric Soil Indicators:					
_____	Histosol	_____	Concretions		
_____	Histic Epipedon	_____	High Organic Content in Surface Layer in Sandy Soils		
_____	Sulfidic Odor	_____	Organic Streaking in Sandy Soils		
_____	Aquic Moisture Regime	_____	Listed on Local Hydric Soils List		
_____	Reducing Conditions	_____	Listed on National Hydric Soils List		
_____	Gleyed or Low-Chroma Colors	_____	Other (Explain in Remarks)		
Remarks: <u>Fails to meet criteria for hydric soils</u> <u>Auger refusal at 9"</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle) Wetland Hydrology Present? Yes <u>No</u> Hydric Soils Present? Yes <u>No</u>	(Circle) Is this Sampling Point Within a Wetland? Yes <u>No</u>
Sketch:	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Station Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finch</u>	Date: <u>06-25-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>PEM</u> Transect ID: <u>W10</u> Plot ID: <u>wet-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Vitis vulpina</u>	<u>V</u>	<u>FAC</u>	8. _____	_____	_____
3. _____	_____	_____	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 2/2 100%

Remarks: Phragmites monoculture in interior

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>4</u> (in.) Depth to Free Water in Pit: <u>0</u> (in.) Depth to Saturated Soil: <u>0</u> (in.)	Remarks: <u>Entirely inundated, obvious boundary</u>

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>South Shore Staten Island</u>	Date: <u>06-26-09</u>
Applicant/Owner: <u>USACE</u>	County: <u>Richmond</u>
Investigator: <u>E. Lema, N. Fuchs</u>	State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: <u>E2EM</u>
Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/>	Transect ID: <u>w11</u>
Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Plot ID: <u>wet-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Impatiens capensis</u>	<u>H</u>	<u>FACW</u>	8. _____	_____	_____
3. <u>Lycopus americanus</u>	<u>H</u>	<u>OBL</u>	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 3/3 100%

Remarks:

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input checked="" type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: <u>8</u> (in.)	Remarks: <u>Area is a large slough - standing water observed in interior.</u>

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>South Shore / Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Frick</u>	Date: <u>06-26-09</u> County: _____ State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? Yes <input checked="" type="radio"/> No (If needed, explain on reverse)	Community ID: <u>up forest</u> Transect ID: <u>W11</u> Plot ID: <u>UP-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Morus rubra</u>	<u>T</u>	<u>FACU</u>	7. _____	_____	_____
2. <u>Lonicera japonica</u>	<u>S</u>	<u>FAC-</u>	8. _____	_____	_____
3. <u>Celastrus orbiculata</u>	<u>V</u>	<u>UPL</u>	9. _____	_____	_____
4. <u>Rhus copallinum</u>	<u>S</u>	<u>NI</u>	10. _____	_____	_____
5. <u>Artemisia vulgaris</u>	<u>H</u>	<u>UPL</u>	11. _____	_____	_____
6. <u>Rosa multiflora</u>	<u>S</u>	<u>FACU</u>	12. _____	_____	_____
Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-):			<u>0/6</u>		
Remarks: <u>Heavily invaded riparian area</u>					

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: <u>Fails to meet criteria for wetland hydrology</u>	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-6</u>	<u>A</u>	<u>10YR3/2</u>	<u>—</u>	<u>—</u>	<u>Loamy Sand</u>
<u>6-16+</u>	<u>B</u>	<u>7.5YR3/3</u>	<u>—</u>	<u>—</u>	<u>Loamy Sand</u>
Hydric Soil Indicators:					
<input type="checkbox"/>	Histosol	<input type="checkbox"/>	Concretions		
<input type="checkbox"/>	Histic Epipedon	<input type="checkbox"/>	High Organic Content in Surface Layer in Sandy Soils		
<input type="checkbox"/>	Sulfidic Odor	<input type="checkbox"/>	Organic Streaking in Sandy Soils		
<input type="checkbox"/>	Aquic Moisture Regime	<input type="checkbox"/>	Listed on Local Hydric Soils List		
<input type="checkbox"/>	Reducing Conditions	<input type="checkbox"/>	Listed on National Hydric Soils List		
<input type="checkbox"/>	Gleyed or Low-Chroma Colors	<input type="checkbox"/>	Other (Explain in Remarks)		
Remarks: <u>Fails to meet hydric soil criteria</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle) Wetland Hydrology Present? Yes <u>No</u> Hydric Soils Present? Yes <u>No</u>	(Circle) Is this Sampling Point Within a Wetland? Yes <u>No</u>
Sketch:	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Station Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finch</u>	Date: <u>06-30-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>PFO</u> Transect ID: <u>W12</u> Plot ID: <u>Wet1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Acer rubrum</u>	<u>T</u>	<u>FAC</u>	7. _____	_____	_____
2. <u>Lindera benzoin</u>	<u>S</u>	<u>FACW</u>	8. _____	_____	_____
3. <u>Rosa multiflora</u>	<u>S</u>	<u>FACU</u>	9. _____	_____	_____
4. <u>Circaea alpina</u>	<u>H</u>	<u>FACW</u>	10. _____	_____	_____
5. <u>Symplocos foetida</u>	<u>H</u>	<u>OBL</u>	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 4/5 80%

Remarks:

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input checked="" type="checkbox"/> Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: <u>10</u> (in.) Depth to Saturated Soil: <u>6</u> (in.)	
Remarks: <u>Appears to be frequently inundated.</u>	

TETRA TECH ROUTINE WETLAND DETERMINATION - DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-8</u>	<u>A</u>	<u>10YR 2/1</u>	<u>-</u>	<u>-</u>	<u>Sandy loam</u>
<u>8-12</u>	<u>B</u>	<u>2.5Y 2.5/1</u>	<u>-</u>	<u>-</u>	<u>Silty clay</u>
<u>12-16+</u>	<u>B</u>	<u>2.5Y 3/1</u>	<u>-</u>	<u>-</u>	<u>loamy sand</u>
Hydric Soil Indicators:					
<input type="checkbox"/>	Histosol	<input type="checkbox"/>	Concretions		
<input type="checkbox"/>	Histic Epipedon	<input type="checkbox"/>	High Organic Content in Surface Layer in Sandy Soils		
<input type="checkbox"/>	Sulfidic Odor	<input type="checkbox"/>	Organic Streaking in Sandy Soils		
<input type="checkbox"/>	Aquic Moisture Regime	<input type="checkbox"/>	Listed on Local Hydric Soils List		
<input type="checkbox"/>	Reducing Conditions	<input type="checkbox"/>	Listed on National Hydric Soils List		
<input checked="" type="checkbox"/>	Gleyed or Low-Chroma Colors	<input type="checkbox"/>	Other (Explain in Remarks)		
Remarks: <u>Possible sedimentation due to construction activities upstream</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	(Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Sketch:	

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>South Shore Staten Island</u>	Date: <u>06-30-09</u>
Applicant/Owner: <u>USACE</u>	County: <u>Richmond</u>
Investigator: <u>E. Lema, N. Finch</u>	State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: <u>U1a</u> Transect ID: <u>W12</u> Plot ID: <u>UP-1</u>
Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>A. lanthornii</u>	<u>T</u>	<u>NI</u>	7. _____	_____	_____
2. <u>Rosa multiflora</u>	<u>S</u>	<u>FACW</u>	8. _____	_____	_____
3. <u>Viola sp</u>	<u>H</u>	<u>?</u>	9. _____	_____	_____
4. <u>Celastrum orbiculatus</u>	<u>V</u>	<u>UPL</u>	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 94

Remarks:

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks:	

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>South Shore Station Island</u>	Date: <u>07-01-09</u>
Applicant/Owner: <u>USACE</u>	County: <u>Richmond</u>
Investigator: <u>E. Lema, N. Finch</u>	State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: <u>PEM</u>
Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/>	Transect ID: <u>W13</u>
Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Plot ID: <u>wet-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Impatiens capensis</u>	<u>H</u>	<u>FACW</u>	8. _____	_____	_____
3. _____	_____	_____	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 2/2 100%

Remarks: Nearly a monotypic stand of phragmites

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>6</u> (in.) Depth to Free Water in Pit: <u>0</u> (in.) Depth to Saturated Soil: <u>0</u> (in.)	Remarks: <u>Steep bank from road into wetland.</u>

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finch</u>	Date: <u>07-02-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>P2EM</u> Transect ID: <u>W13-</u> Plot ID: <u>wet2</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Schoenoplectus americanus</u>	<u>H</u>	<u>OBL</u>	8. _____	_____	_____
3. <u>Toxicodendron radicans</u>	<u>V</u>	<u>FAC</u>	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 3/3 100%

Remarks: Nearly a monotypic stand of phragmites

HYDROLOGY

 Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available 	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>2</u> (in.) Depth to Free Water in Pit: <u>0</u> (in.) Depth to Saturated Soil: <u>0</u> (in.)	Remarks: <u>Inundated immediately off of the paved upland</u>

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2	A	10YR2/1	—	—	Mucky mineral
2-2.5	B	7.5YR4/1	—	—	Silty clay loam
2.5-10	B	10YR3/1	—	—	Sandy loam
					- 20% coarse fragments
Hydric Soil Indicators:					
<input type="checkbox"/>	Histosol	<input type="checkbox"/>	Concretions		
<input type="checkbox"/>	Histic Epipedon	<input type="checkbox"/>	High Organic Content in Surface Layer in Sandy Soils		
<input type="checkbox"/>	Sulfidic Odor	<input type="checkbox"/>	Organic Streaking in Sandy Soils		
<input type="checkbox"/>	Aquic Moisture Regime	<input type="checkbox"/>	Listed on Local Hydric Soils List		
<input type="checkbox"/>	Reducing Conditions	<input type="checkbox"/>	Listed on National Hydric Soils List		
<input type="checkbox"/>	Gleyed or Low-Chroma Colors	<input type="checkbox"/>	Other (Explain in Remarks)		
Remarks: <i>Auger refusal at 10". Narrow B horizon very distinct. Likely filled in past for road construction through current wetland</i>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	(Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Sketch: <i>unable to obtain an upland plot - all adjacent areas paved or riprap.</i>	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finck</u>	Date: <u>07-01-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? Yes <input checked="" type="radio"/> No (If needed, explain on reverse)	Community ID: <u>UFOR</u> Transect ID: <u>W13</u> Plot ID: <u>UP-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Ailanthus altissima</u>	<u>T</u>	<u>FACU</u>	7. _____	_____	_____
2. <u>Prunus virginiana</u>	<u>S</u>	<u>FACU</u>	8. _____	_____	_____
3. <u>Toxicodendron radicans</u>	<u>V</u>	<u>FAC</u>	9. _____	_____	_____
4. <u>Parthenocissus quinquefolia</u>	<u>V</u>	<u>FACU</u>	10. _____	_____	_____
5. <u>Antennaria vulgaris</u>	<u>H</u>	<u>UPL</u>	11. _____	_____	_____
6. <u>Glechoma hederacea</u>	<u>H</u>	<u>FACU</u>	12. _____	_____	_____
Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).			<u>1/6 16%</u>		
Remarks: <u>Edge community between road and wetland.</u>					

HYDROLOGY

 ___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide-Gauge ___ Aerial Photographs ___ Other ___ No Recorded Data Available 	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated ___ Saturated in Upper 12 inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Remarks: <u>Fails to meet hydrology criteria</u>	

TETRA TECH ROUTINE WETLAND DETERMINATION - DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-4</u>	<u>A</u>	<u>10YR2/2</u>	<u>-</u>	<u>-</u>	<u>Endy loam</u>
<u>4-9</u>	<u>B</u>	<u>10YR3/3</u>	<u>-</u>	<u>-</u>	<u>Sandy loam</u>
<u>9-11</u>	<u>B</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>Gravel</u>
Hydric Soil Indicators:					
<input type="checkbox"/>	Histosol	<input type="checkbox"/>	Concretions		
<input type="checkbox"/>	Histic Epipedon	<input type="checkbox"/>	High Organic Content in Surface Layer in Sandy Soils		
<input type="checkbox"/>	Sulfidic Odor	<input type="checkbox"/>	Organic Streaking in Sandy Soils		
<input type="checkbox"/>	Aquic Moisture Regime	<input type="checkbox"/>	Listed on Local Hydric Soils List		
<input type="checkbox"/>	Reducing Conditions	<input type="checkbox"/>	Listed on National Hydric Soils List		
<input type="checkbox"/>	Gleyed or Low-Chroma Colors	<input type="checkbox"/>	Other (Explain in Remarks)		
Remarks: <u>Fails to meet hydric soils criteria.</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle) Wetland Hydrology Present? Yes <u>No</u> Hydric Soils Present? Yes <u>No</u>	(Circle) Is this Sampling Point Within a Wetland? Yes <u>No</u>
Sketch:	

TETRA TECH
ROUTINE WETLAND DETERMINATION - DATA FORM

Project/Site: <u>South Shore Staten Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finch</u>	Date: <u>07-01-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>PFO</u> Transect ID: <u>W14</u> Plot ID: <u>Wet 1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Acer rubrum</u>	<u>T</u>	<u>FAC</u>	7. _____	_____	_____
2. <u>Ulmus rubra</u>	<u>T</u>	<u>FAC</u>	8. _____	_____	_____
3. <u>Viburnum recognitum</u>	<u>S</u>	<u>FACW</u>	9. _____	_____	_____
4. <u>Polygonum hydropiper</u>	<u>H</u>	<u>OBL</u>	10. _____	_____	_____
5. <u>Polygonum cuspidatum</u>	<u>H</u>	<u>FACV</u>	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 45 80%

Remarks: Floodplain wetland along south bank of stream

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><input type="checkbox"/> Stream, Lake, or Tide-Gauge</p> <p><input type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input type="checkbox"/> Oxidized Root Channels in Upper 12 inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: <u>4</u> (in.)</p>	<p>Remarks:</p>

TETRA TECH ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8	A	10YR2/1			Sandy clay loam
8-16	B	2.5YR3/1	Many iron nodules	2.5YR5/1	Sandy clay loam
Hydric Soil Indicators:					
<input type="checkbox"/>	Histosol	<input type="checkbox"/>	Concretions		
<input type="checkbox"/>	Histic Epipedon	<input type="checkbox"/>	High Organic Content in Surface Layer in Sandy Soils		
<input type="checkbox"/>	Sulfidic Odor	<input type="checkbox"/>	Organic Streaking in Sandy Soils		
<input type="checkbox"/>	Aquic Moisture Regime	<input type="checkbox"/>	Listed on Local Hydric Soils List		
<input type="checkbox"/>	Reducing Conditions	<input type="checkbox"/>	Listed on National Hydric Soils List		
<input type="checkbox"/>	Gleyed or Low-Chroma Colors	<input type="checkbox"/>	Other (Explain in Remarks)		
Remarks: <u>Area may have been filled in past. mounds visible</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes No (Circle) Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes No Hydric Soils Present? <input checked="" type="checkbox"/> Yes No	(Circle) Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes No
Sketch: 	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Station Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lena N. Finch</u>	Date: <u>07-01-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>UFOR</u> Transect ID: <u>W14</u> Plot ID: <u>up-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Quercus alba</u>	<u>T</u>	<u>FACU-</u>	7. _____	_____	_____
2. <u>Quercus rubra</u>	<u>T</u>	<u>FACU-</u>	8. _____	_____	_____
3. <u>Polygonum crispatum</u>	<u>H</u>	<u>FACU</u>	9. _____	_____	_____
4. <u>Athyrium Filix-Femina</u>	<u>H</u>	<u>FAC</u>	10. _____	_____	_____
5. <u>Rosmariniflora</u>	<u>S</u>	<u>FACU</u>	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 1/5 20%

Remarks: Under-story heavily invaded

HYDROLOGY

 Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available 	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Remarks: <u>Fails to meet criteria for wetland hydrology</u>

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not Available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-2</u>	<u>A</u>	<u>10YR2/2</u>	<u>-</u>	<u>-</u>	<u>partly organic</u>
<u>2-9</u>	<u>A</u>	<u>10YR2/2</u>	<u>-</u>	<u>-</u>	<u>silty loam</u>
<u>9-18+</u>	<u>B</u>	<u>7.5YR4/3</u>	<u>-</u>	<u>-</u>	<u>clay loam</u>
Hydric Soil Indicators:					
	<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions		
	<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils		
	<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils		
	<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List		
	<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List		
	<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)		
Remarks: <u>Fails to meet hydric soil criteria</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle) Wetland Hydrology Present? Yes <u>No</u> Hydric Soils Present? Yes <u>No</u>	(Circle) Is this Sampling Point Within a Wetland? Yes <u>No</u>
Sketch:	

**TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM**

Project/Site: <u>South Shore Station Island</u>	Date: <u>07-02-09</u>
Applicant/Owner: <u>USACE</u>	County: <u>Richmond</u>
Investigator: <u>E. Lema, M. Finch</u>	State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: <u>PEM</u>
Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/>	Transect ID: <u>W15</u>
Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Plot ID: <u>wet-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phragmites australis</u>	<u>H</u>	<u>FACW</u>	7. _____	_____	_____
2. <u>Impatiens capensis</u>	<u>H</u>	<u>FACW</u>	8. _____	_____	_____
3. _____	_____	_____	9. _____	_____	_____
4. _____	_____	_____	10. _____	_____	_____
5. _____	_____	_____	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 2/2 100%

Remarks: Typical phragmites dominated wetland

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><input type="checkbox"/> Stream, Lake, or Tide Gauge</p> <p><input type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input type="checkbox"/> Saturated in Upper 12 inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input type="checkbox"/> Oxidized Root Channels in Upper 12 inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: <u>4</u> (in.)</p> <p>Depth to Free Water in Pit: <u>0</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	
<p>Remarks: <u>Inundated immediately off of property boundary</u></p>	

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

Project/Site: <u>South Shore Station Island</u> Applicant/Owner: <u>USACE</u> Investigator: <u>E. Lema, N. Finch</u>	Date: <u>07-02-09</u> County: <u>Richmond</u> State: <u>NY</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (A typical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse)	Community ID: <u>up 606</u> Transect ID: <u>W15</u> Plot ID: <u>up-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Polygonum cuspidatum</u>	<u>H</u>	<u>FACU</u>	7. _____	_____	_____
2. <u>Taraxacum officinale</u>	<u>H</u>	<u>FACU</u>	8. _____	_____	_____
3. <u>Trifolium repens</u>	<u>H</u>	<u>FACU-</u>	9. _____	_____	_____
4. <u>Meibomia auctorum</u>	<u>H</u>	<u>UPL</u>	10. _____	_____	_____
5. <u>Plantago major</u>	<u>H</u>	<u>FACU</u>	11. _____	_____	_____
6. _____	_____	_____	12. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0/5

Remarks: Main field bordering residential property

HYDROLOGY

 Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No-Recorded Data Available 	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Remarks: <u>Fails to meet hydrology criteria</u>

TETRA TECH
ROUTINE WETLAND DETERMINATION – DATA FORM

SOILS

Map Unit Name (Series and Phase): <u>Not available</u>		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
<u>0-5</u>	<u>A</u>	<u>10YR3/2</u>	<u>-</u>	<u>-</u>	<u>Sandy clay loam</u>
<u>5-8</u>	<u>B</u>	<u>7.5YR4/4</u>	<u>-</u>	<u>-</u>	<u>Sandy clay</u>
<u>8-8</u>	<u>B</u>	<u>10YR 2/2</u>	<u>-</u>	<u>-</u>	<u>Sandy clay</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:	
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)

Remarks: Auger refusal at 8". Fails to meet hydric soil criteria.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle) Wetland Hydrology Present? Yes <u>No</u> Hydric Soils Present? Yes <u>No</u>	(Circle) Is this Sampling Point Within a Wetland? Yes <u>No</u>
Sketch:	